Attachment A

Application Cover Sheet

Name of Respondent: Deloitte Consulting LLP			
Mailing Address: 115 Federal Street	City/Town: Boston	State: MA	Zip Code: 02110
Telephone: 1.202.230.2435	Fax: 1.571.882.7423	Web Address: www.deloitte.com	
Primary Contact for Clarification: Rachel Rubenstein		Primary Contact E-mail Address: rrubenstein@deloitte.com	
Authorized Signatory: Rachel Rubenstein		Authorized Signatory E-mail Address: rrubenstein@deloitte.com	
Legal Status/Jurisdiction(e.g., a Massahusetts Corporation, LLC, LLP, etc.): LLP		Respondents W-9 (attached) Respondents UEI No.: CKV2L9GZKJK3	

Attachment A

Application Cover Sheet

Name of Respondent: Deloitte Consulting LLP			
Mailing Address: 115 Federal Street	City/Town: Boston	State: MA	Zip Code: 02110
Telephone: 1.202.230.2435	Fax: 1.571.882.7423	Web Address: www.deloitte.com	
Primary Contact for Clarification: Rachel Rubenstein		Primary Contact E-mail Address: rrubenstein@deloitte.com	
Authorized Signatory: Rachel Rubenstein		Authorized Signatory E-mail Address: rrubenstein@deloitte.com	
Legal Status/Jurisdiction(e.g., a Massahusetts Corporation, LLC, LLP, etc.): LLP		Respondents W-9 (attached) Respondents UEI No.: CKV2L9GZKJK3	

Form **W-9**
(Rev. March 2024)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give form to the requester. Do not send to the IRS.

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See ***Specific Instructions*** on page 3.

1 Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)

DELOITTE CONSULTING LLP

2 Business name/disregarded entity name, if different from above.

3a Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor ☐ C corporation ☐ S corporation ☑ Partnership ☐ Trust/estate

☐ LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) . . . .

Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner.

☐ Other (see instructions)

3b If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions . . . . . ☐

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) NA

Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any) NA

(Applies to accounts maintained outside the United States.)

5 Address (number, street, and apt. or suite no.). See instructions.

4022 SELLS DRIVE

6 City, state, and ZIP code

HERMITAGE, TN 37076

Requester's name and address (optional)

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

0	6	–	1	4	5	4	5	1	3

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** JMarino **Date** 01/07/2025

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

must obtain your correct taxpayer identification number (TIN), which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

• Form 1099-INT (interest earned or paid).

• Form 1099-DIV (dividends, including those from stocks or mutual funds).

• Form 1099-MISC (various types of income, prizes, awards, or gross proceeds).

• Form 1099-NEC (nonemployee compensation).

• Form 1099-B (stock or mutual fund sales and certain other transactions by brokers).

• Form 1099-S (proceeds from real estate transactions).

• Form 1099-K (merchant card and third-party network transactions).

• Form 1098 (home mortgage interest), 1098-E (student loan interest), and 1098-T (tuition).

• Form 1099-C (canceled debt).

• Form 1099-A (acquisition or abandonment of secured property).

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

Caution: If you don't return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued);

2. Certify that you are not subject to backup withholding; or

3. Claim exemption from backup withholding if you are a U.S. exempt payee; and

4. Certify to your non-foreign status for purposes of withholding under chapter 3 or 4 of the Code (if applicable); and

5. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting is correct. See *What Is FATCA Reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

• An individual who is a U.S. citizen or U.S. resident alien;

• A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;

• An estate (other than a foreign estate); or

• A domestic trust (as defined in Regulations section 301.7701-7).

Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding. Payments made to foreign persons, including certain distributions, allocations of income, or transfers of sales proceeds, may be subject to withholding under chapter 3 or chapter 4 of the Code (sections 1441–1474). Under those rules, if a Form W-9 or other certification of non-foreign status has not been received, a withholding agent, transferee, or partnership (payor) generally applies presumption rules that may require the payor to withhold applicable tax from the recipient, owner, transferor, or partner (payee). See Pub. 515, Withholding of Tax on Nonresident Aliens and Foreign Entities.

The following persons must provide Form W-9 to the payor for purposes of establishing its non-foreign status.

• In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the disregarded entity.

• In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the grantor trust.

• In the case of a U.S. trust (other than a grantor trust), the U.S. trust and not the beneficiaries of the trust.

See Pub. 515 for more information on providing a Form W-9 or a certification of non-foreign status to avoid withholding.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person (under Regulations section 1.1441-1(b)(2)(iv) or other applicable section for chapter 3 or 4 purposes), do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515). If you are a qualified foreign pension fund under Regulations section 1.897(l)-1(d), or a partnership that is wholly owned by qualified foreign pension funds, that is treated as a non-foreign person for purposes of section 1445 withholding, do not use Form W-9. Instead, use Form W-8EXP (or other certification of non-foreign status).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a saving clause. Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if their stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first Protocol) and is relying on this exception to claim an exemption from tax on their scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include, but are not limited to, interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third-party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester;

2. You do not certify your TIN when required (see the instructions for Part II for details);

3. The IRS tells the requester that you furnished an incorrect TIN;

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only); or

5. You do not certify to the requester that you are not subject to backup withholding, as described in item 4 under "*By signing the filled-out form*" above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier.

What Is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all U.S. account holders that are specified U.S. persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you are no longer tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account, for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

• **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note for ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040 you filed with your application.

• **Sole proprietor.** Enter your individual name as shown on your Form 1040 on line 1. Enter your business, trade, or "doing business as" (DBA) name on line 2.

• **Partnership, C corporation, S corporation, or LLC, other than a disregarded entity.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

• **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. Enter any business, trade, or DBA name on line 2.

• **Disregarded entity.** In general, a business entity that has a single owner, including an LLC, and is not a corporation, is disregarded as an entity separate from its owner (a disregarded entity). See Regulations section 301.7701-2(c)(2). A disregarded entity should check the appropriate box for the tax classification of its owner. Enter the owner's name on line 1. The name of the owner entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2. If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, enter it on line 2.

Line 3a

Check the appropriate box on line 3a for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3a.

IF the entity/individual on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation.
• Individual or • Sole proprietorship	Individual/sole proprietor.
• LLC classified as a partnership for U.S. federal tax purposes or • LLC that has filed Form 8832 or 2553 electing to be taxed as a corporation	Limited liability company and enter the appropriate tax classification: P = Partnership, C = C corporation, or S = S corporation.
• Partnership	Partnership.
• Trust/estate	Trust/estate.

Line 3b

Check this box if you are a partnership (including an LLC classified as a partnership for U.S. federal tax purposes), trust, or estate that has any foreign partners, owners, or beneficiaries, and you are providing this form to a partnership, trust, or estate, in which you have an ownership interest. You must check the box on line 3b if you receive a Form W-8 (or documentary evidence) from any partner, owner, or beneficiary establishing foreign status or if you receive a Form W-9 from any partner, owner, or beneficiary that has checked the box on line 3b.

Note: A partnership that provides a Form W-9 and checks box 3b may be required to complete Schedules K-2 and K-3 (Form 1065). For more information, see the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

If you are required to complete line 3b but fail to do so, you may not receive the information necessary to file a correct information return with the IRS or furnish a correct payee statement to your partners or beneficiaries. See, for example, sections 6698, 6722, and 6724 for penalties that may apply.

Line 4 Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

• Generally, individuals (including sole proprietors) are not exempt from backup withholding.

• Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.

• Corporations are not exempt from backup withholding for payments made in settlement of payment card or third-party network transactions.

• Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space on line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2).

2—The United States or any of its agencies or instrumentalities.

3—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities.

5—A corporation.

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or territory.

7—A futures commission merchant registered with the Commodity Futures Trading Commission.

8—A real estate investment trust.

9—An entity registered at all times during the tax year under the Investment Company Act of 1940.

10—A common trust fund operated by a bank under section 584(a).

11—A financial institution as defined under section 581.

12—A middleman known in the investment community as a nominee or custodian.

13—A trust exempt from tax under section 664 or described in section 4947.

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
• Interest and dividend payments	All exempt payees except for 7.
• Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
• Barter exchange transactions and patronage dividends	Exempt payees 1 through 4.
• Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5.[2]
• Payments made in settlement of payment card or third-party network transactions	Exempt payees 1 through 4.

[1] See Form 1099-MISC, Miscellaneous Information, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) entered on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37).

B—The United States or any of its agencies or instrumentalities.

C—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i).

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i).

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state.

G—A real estate investment trust.

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940.

I—A common trust fund as defined in section 584(a).

J—A bank as defined in section 581.

K—A broker.

L—A trust exempt from tax under section 664 or described in section 4947(a)(1).

M—A tax-exempt trust under a section 403(b) plan or section 457(g) plan.

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, enter "NEW" at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have, and are not eligible to get, an SSN, your TIN is your IRS ITIN. Enter it in the entry space for the Social security number. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.SSA.gov*. You may also get this form by calling 800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/EIN*. Go to *www.irs.gov/Forms* to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to *www.irs.gov/OrderForms* to place an order and have Form W-7 and/or Form SS-4 mailed to you within 15 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and enter "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, you will generally have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon. See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier, for when you may instead be subject to withholding under chapter 3 or 4 of the Code.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third-party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLE accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor[2]
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee[1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner[1]
6. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
7. Grantor trust filing under Optional Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))**	The grantor*
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity[4]
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing Form 1041 or under the Optional Filing Method 2, requiring Form 1099 (see Regulations section 1.671-4(b)(2)(i)(B))**	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name on line 1, and enter your business or DBA name, if any, on line 2. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.)

* **Note:** The grantor must also provide a Form W-9 to the trustee of the trust.

** For more information on optional filing methods for grantor trusts, see the Instructions for Form 1041.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information, such as your name, SSN, or other identifying information, without your permission to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax return preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity, or a questionable credit report, contact the IRS Identity Theft Hotline at 800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 877-777-4778 or TTY/TDD 800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 800-366-4484. You can forward suspicious emails to the Federal Trade Commission at *spam@uce.gov* or report them at *www.ftc.gov/complaint*. You can contact the FTC at *www.ftc.gov/idtheft* or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see *www.IdentityTheft.gov* and Pub. 5027.

Go to *www.irs.gov/IdentityTheft* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and territories for use in administering their laws. The information may also be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payors must generally withhold a percentage of taxable interest, dividends, and certain other payments to a payee who does not give a TIN to the payor. Certain penalties may also apply for providing false or fraudulent information.

Deloitte.

Commonwealth of Massachusetts Technical Proposal

Massachusetts Technology Collaborative

RFP No. 2026-JAII-01 | October 7, 2025

Deloitte Consulting LLP
115 Federal Street, Winthrop Center Floors 12-15 | Boston, MA 02110

Deloitte.

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Sabrina Mansur
75 North Drive
Westborough, MA 01581-3340
proposals@masstech.org

RE: Solicitation No. 2026-JAII-01 – Request for Proposals for AI Hub Data Commons Collaborative Consulting Services

Dear Ms. Mansur:

Deloitte Consulting LLP ("Deloitte") is pleased to submit this proposal to the Massachusetts Technology Collaborative (MassTech) in response to the Request for Proposals for AI Hub Data Commons Collaborative (DCC) Consulting Services. We share your ambition of making AI a force for good and we are excited at the prospect to work with MassTech to establish a new legacy of AI innovation in Massachusetts.

Deloitte offers extensive experience to support the MassTech AI Hub's Data Commons Collaborative initiative. With over 40 years of dedicated service to the Commonwealth, our team has a demonstrated track record of delivering impactful initiatives, including a highly effective collaboration with Snowflake for the Massachusetts Department of Public Health's (DPH) Data Modernization Initiative and multiple customer-facing system implementations for the Executive Office of Economic Development (EOED) and Health and Human Services (EOHHS).

Deloitte is committed to delivering exceptional value by meeting your current requirements and anticipating your future needs. Our proposal includes a delivery model that balances your inspiring ambitions for the Data Commons Collaborative with the need to steward public resources effectively. We look forward to working with you to find the correct combination of flexibility, efficiency, and cost-effectiveness.

We look forward to working with MassTech and the AI Hub team on this important initiative. If you have any questions, please contact me at rrubenstein@deloitte.com or +1 202 230 2435.

Sincerely,

Rachel Rubenstein, Principal
Deloitte Consulting LLP

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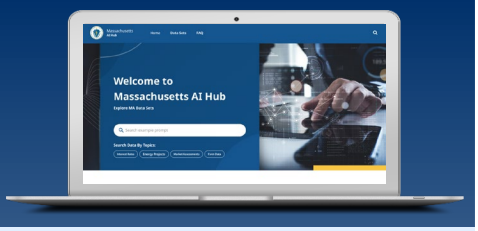
EXECUTIVE SUMMARY

"Since the founding of our country, Massachusetts has pioneered revolutionary innovations that changed human history, from developing the first computer to creating lifesaving vaccines. Today, we are building on that longstanding legacy with the Massachusetts AI Hub."

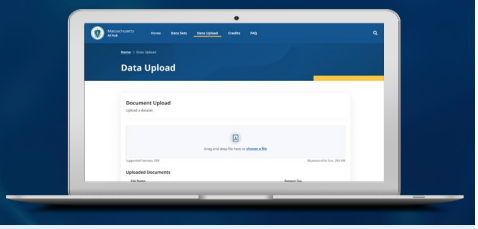
Governor Maura Healey

Massachusetts is poised to lead the nation in ethical, transformative AI through the MassTech AI Hub's Data Commons Collaborative (DCC) initiative. Building a collaborative AI data commons will accelerate research and lower barriers to data access, thereby unlocking the full potential of Massachusetts' innovation ecosystem. Deloitte's DCC solution empowers the Commonwealth to build a secure, scalable data platform that will set a new benchmark for AI-driven economic growth and community progress.

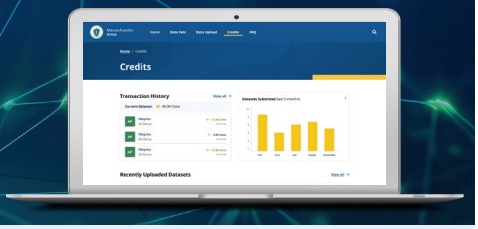
DATA COMMONS DIGITAL EXPERIENCE



Dataset Search & Exploration



Dataset Upload



Commons Credits

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Access to high-quality data fuels AI innovation, yet siloed, fragmented datasets often hold back even the brightest minds. We understand that the DCC must combine an intuitive, engaging digital experience with a foundation of rich data resources, undergirded by a governance framework that maintains trust and safety in AI data and models.

Why Deloitte?

- Our technical solution revolves around Snowflake, with whom we have previously partnered within the Commonwealth, to create a gateway to AI-enabled datasets.
- We have built portals and data hubs used by millions of Americans – and we've already started designing the DCC portal (see *Data Commons Digital Experience*).
- We offer AI management and oversight experience proven through our work with AWS, Anthropic, and OpenAI

We bring the experience, technology, and insights the MassTech AI Hub needs to make the DCC portal a vital hub in the national AI ecosystem:

A technology stack that combines Snowflake's foundational data platform with Deloitte's end-to-end solution architecture for tailored data federation and data product delivery.

A user-centric platform and web build-out approach that will enable the Data Commons to deliver immediate and ongoing value to startups, researchers, and agencies.

Demonstrated experience in data management and AI acceleration, enabling a Data Commons that is secure, scalable, and ready to support advanced AI use cases.

Since pioneering public sector AI in 2015, Deloitte's 2,000+ US-based AI-focused professionals have deployed mission-critical solutions supporting over 100 million interactions annually. Recognized by Gartner and IDC MarketScape as AI industry leaders, we combine technical excellence with proven delivery.

Deloitte and Snowflake Bring a Tailored AI Data Solution

Deloitte proposes a DCC technology solution that can be deployed rapidly and scaled to meet user needs. Our work with Snowflake delivering data sharing solutions across over a dozen states and Federal agencies has enabled leaders to make real-time decisions and improve citizen services. Our Snowflake-powered architecture will drive a secure, high-performance cloud data platform—enabling seamless data sharing, advanced analytics, and scalable AI workloads.

Our solution integrates diverse datasets while maintaining rigorous governance and security. This empowers the AI Hub to create tailored data products, driving collaboration and unlocking new AI opportunities.

MassTech AI Hub Evaluation Criteria	Highlights of Deloitte's Qualifications
Demonstrated technical and platform delivery experience	• Deloitte and Snowflake matched and merged 100m+ records via a data modernization initiative for the Mass Dept. of Public Health • We built data.ferc.gov, a data hub website and hosting platform which serves thousands of research and industry customers
Familiarity with metadata standards, synthetic data, and AI fairness tools	• At a major rail network, we transformed enterprise metadata management using AI-powered discovery tools • We built the FDIC's synthetic data generation capability, making high-quality data available for testing and AI/Model training via APIs • For CalTrans, we built a solution for infrastructure management that safeguarded AI fairness and mitigated bias through LLM input context guardrails and monitoring tools
Quality and clarity of proposed project plan and high-level architecture approach	• We will rapidly stand up the DCC portal MVP using accelerators from our proven data hub deliveries, like data.ferc.gov • We will incrementally onboard datasets based on user input, AI Hub leadership input , and Governance Board priorities
Feasibility of timeline to complete program scope	• We will quickly align on MVP scope and build a working portal within 3 months and grow toward the full DCC vision within the first year
Qualifications and availability of proposed team	• Our team leaders, who will be highly focused on this project, are recognized authorities on trustworthy AI and have partnered with Snowflake for data platforms in MA
Budget realism, alignment with scope, and cost-effectiveness	• We prioritize low-cost, high-quality cloud-agnostic solutions and bring experienced resources who can rapidly deliver
Strength and relevance of references and prior work	• We bring deep experience across commercial, government, and higher ed and have delivered in all required service areas – for example, at NIH where we built a data platform, delivered a user portal, enabled GenAI tools, implemented metadata standards, maintained access control, and provided anomaly detection

Deloitte's AI Ready Management Framework enables data to be prepared, governed, and operationalized for AI applications—embedding ethics, privacy, and security from the start. Our proven expertise across the data lifecycle maximizes utility and minimizes risk, making data truly actionable for AI innovation and responsible deployment.

Our human-centered design approach puts user needs first. Deloitte's design teams work directly with stakeholders to prioritize high-impact use cases, enabling secure data sharing, real-time analytics, and cross-sector collaboration. Through rapid prototyping and iterative deployment, the Data Commons delivers tangible benefits early and adapts continuously for maximum effectiveness. On the next page, we home in on DCC user journeys.

We Understand How to Deliver on Your Requirements

Deloitte appreciates the thoughtful work that the AI Hub team has invested into creating a vision and requirements for the Data Commons Collaborative. In the pages that follow, we lay out our detailed plan for building a solution that aligns to each of your key functional requirement areas. Below is a summary of how we will deliver on your requirements.

DCC Functional Requirements	How Our Solution Delivers
External Data Sets and Data Capabilities	Deploys a cloud-agnostic, modular architecture (Snowflake-based) with automated pipelines for secure integration, metadata management, and scalable access to diverse external datasets.
Website Functionality for Hosted Data Access	Delivers a user-friendly web portal and robust APIs, enabling intuitive dataset discovery, preview, and secure downloads for all user types.
Commons Credits System	Implements a transparent, automated credits ledger, integrated with identity management to reward contributions and ensure equitable, auditable data access.
Data Catalog and Metadata Management System	Provides a unified catalog with advanced metadata, search, and lineage capabilities, supporting governance and dynamic access policies.
Dataset Curation Plan	Facilitates agile, collaborative curation guided by stakeholder priorities, privacy safeguards, and continuous data quality assessment.
Synthetic Data Generation	Enables privacy-preserving synthetic data creation and validation within secure, governed zones to support safe experimentation and sharing.
AI Fairness and Bias Capability	Embeds proprietary bias detection and mitigation tools across the data & AI lifecycle, ensuring fairness, transparency, and regulatory compliance.
Governance Requirements	Enforces role-based access, zero-trust security, and automated workflow approvals with comprehensive audit logging and incident response.
Security and Access Control Requirements	Applies multi-layer encryption, adaptive authentication, and dynamic, consent-driven access controls to safeguard data and platform operations.
Governance Policies and Ethical Guidelines	Embeds clear ethical standards and ongoing policy education, supported by continuous auditing to ensure responsible, compliant data use.

Our approach prioritizes rapid, incremental deliveries and continuous feedback. We aim to deploy an initial minimum viable product (MVP) release of the DCC portal to pilot users by Month 3, as depicted below. We will continue to expand portal functionality, data sets, and additional capabilities based on AI Hub priorities and user inputs.

MONTH 1	MONTH 2	MONTH 3	MONTH 4-5	MONTH 6	MONTH 7-12
• Stand-up infrastructure • Host discovery lab sessions with stakeholders	• Complete initial UX designs and get user feedback • Confirm initial dataset use cases for onboarding	• MVP portal and data catalog release for pilot users • Begin iterative onboarding of additional data sets	• Add in user authentication to portal MVP • First release of Commons Credits functionality • Capture and triage pilot user feedback	• Public roll-out of initial portal functionality • Refine feature roadmap based on feedback and program priorities	• Iterative releases of additional portal features and data sets

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Real-Life Needs Will Drive DCC Design and Expansion

Deloitte's approach to building the DCC starts with deeply understanding the ambitions, challenges, and workflows of the diverse ecosystem—startups, researchers, public agencies, and AI partners—who will rely on the portal. Our process brings end users into the room with designers, engineers, and stakeholders to co-create solutions, rapidly prototype ideas, and iterate based on real feedback. This collaborative, design-led approach enables us to quickly test concepts, discard what doesn't work, and refine what does—minimizing risk and accelerating delivery of features that matter most. By prioritizing usability, accessibility, and engagement, we will build a portal that is not just a data repository, but a dynamic, indispensable workspace that users want to return to.

Meet Quinn – One of Our DCC User Personas

Quinn is a researcher at a healthcare startup in Boston that has partnered with the Department of Children and Families to focus on big questions in health equity, like these:

- How might we build predictive models for early detection of diabetes?
- Do children involved in child support cases have poorer long-term health outcomes?
- How can child and family services programs mitigate the risk of chronic illness?

Here's how our design process yields a DCC experience that supports Quinn's research needs – and the health outcomes of thousands of children and families in Massachusetts:

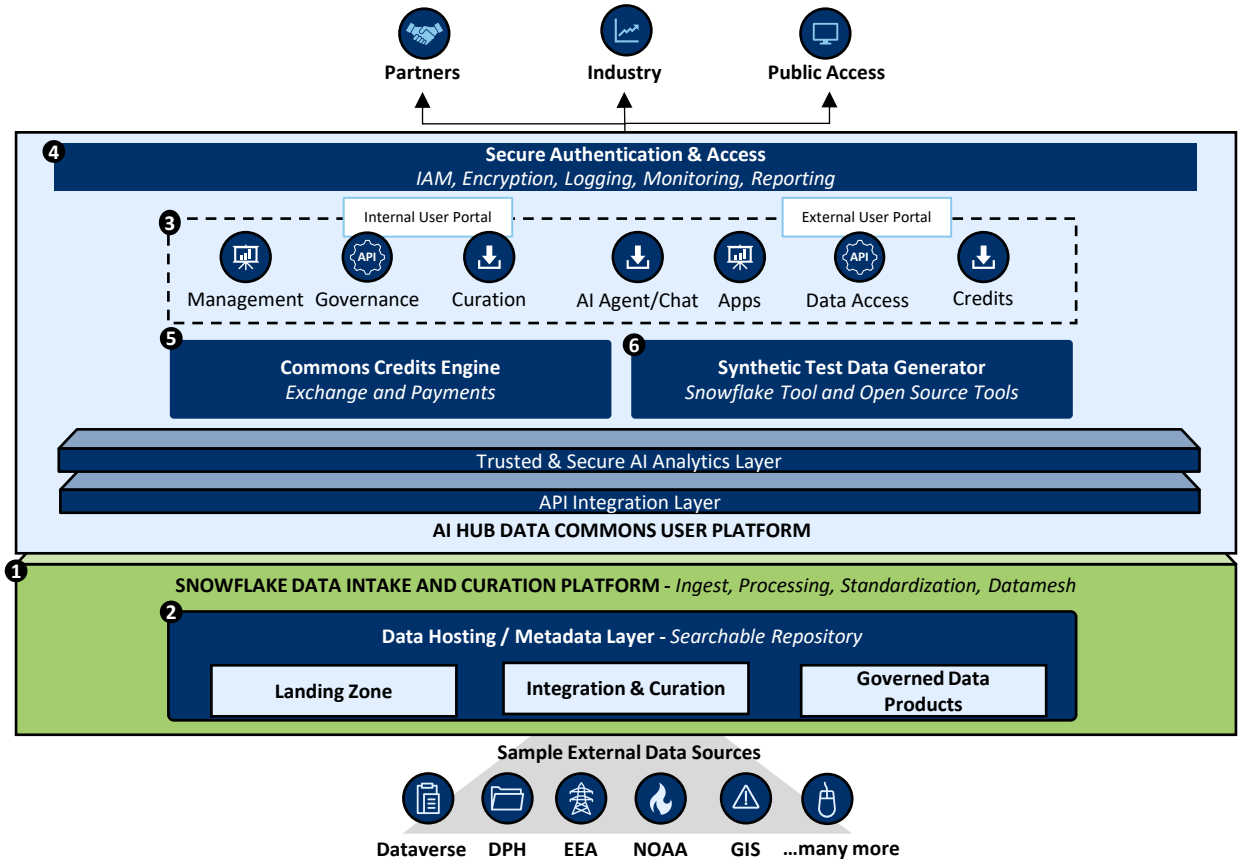
Perspectives from Quinn…	Quinn wants an easy interface to discover relevant data	Quinn's questions can't be answered by a single existing dataset	Quinn wants to contribute to the public health research community
…Built directly into the DCC experience	DCC hosts a home page with a **conversational AI chatbot** to quickly connect Quinn to data	DCC provides **curated data products** that combine multiple datasets and **synthetic data**	DCC enables Quinn **to get credit for tagging data** and contributing new high-quality sources

We translate insights from Quinn and other user personas into a digital experience that is clear, engaging, and tailored to users' day-to-day needs. Role-based access, personalized dashboards, and guided data discovery empower users to find, share, and analyze datasets effortlessly. The portal's design absorbs process complexity, presenting only what's relevant and actionable, so users can focus on innovation, collaboration, and impact.

Deloitte has built digital products for millions of Americans across 40+ states, dozens of Federal agencies, and hundreds of leading commercial organizations. This means we bring the skills, technology, and empathy needed to make the Data Commons Collaborative portal a trusted hub for Massachusetts' AI ecosystem. By embedding human-centered design at every step, we deliver a solution that is not only technically robust, but also truly indispensable for its users.

Empowering MassTech to Foster AI Excellence in Massachusetts

In partnership with the MassTech AI Hub, Deloitte's solution is poised to create a Data Commons that is aligned with the needs of Massachusetts' innovation community—maintaining fairness, fostering collaboration, and setting a new standard for AI excellence.



1 DATA INTAKE AND CURATION	2 DATA CATALOG	3 PORTALS: INTERNAL & EXTERNAL
• Snowflake platform for curated data sets • Data governance policies and framework • Integration with externally hosted datasets	• Discover and search all available data • Unified catalog of data across all types/sources • Rich metadata for each dataset • Usage tracking and user feedback	• Search, explore, analyze, visualize, and download datasets • Internal management of data curation, credits, and user access
4 AUTHENTICATION & ACCESS	**5 COMMONS CREDITS**	**6 SYNTHETIC TEST DATA**
• Identity and access management • Authorization management • Consent management • Secure API endpoints	• Credits tracking system integrated with external and internal user portals • Flexible business rules framework to enable easy management of Credits policies • Data platform integration to drive responsible usage and management of data and compute resources	• Augmentation of existing data sources to enable richer use cases • Enabled by Snowflake's native, highly flexible data generation tool • Additional capabilities can be incrementally added using open-source data generators (e.g., SDV)

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Together, we can unlock the full potential of Massachusetts' innovation ecosystem, establishing the Commonwealth as a beacon for AI excellence and a model for the nation. Deloitte is excited to bring our experience, passion, and proven approach to this transformative initiative.

2.0 Requested Services Approach

2.0 Requested Services Approach

Delivering on the MassTech AI Hub's Vision

We are inspired by AI Hub leadership's vision for making AI a force for good by cultivating people-centric applications of the power of LLMs and GenAI – like public health and family well-being. The AI Hub will serve a diverse ecosystem of users, from individual developers to large research institutions and AI partners. A one-size-fits-all approach to data access will prevent the DCC from truly activating the AI Hub vision.

In the table below, we have aligned the AI Hub's functional requirements for the DCC with our proposed solution for each component. In the pages that follow, we provide a deep dive into each piece of DCC functionality to explain how we deliver and why we are positioned to full activate the AI Hub's transformative ambitions.

The AI Hub Vision

"AI is a technology that could become a force for good or a force for ill. That depends on our actions as people and how we're using it. So the AI Hub is focused on applying AI, it's focused on helping people adopt AI into the work they're doing, and upscaling themselves in the work they're doing with AI. We really are focused on the good, and the adoption of the good, and making it useful and productive"

Sabrina Mansur
AI Hub Executive Director

How Deloitte Delivers on Key DCC Functional Requirements

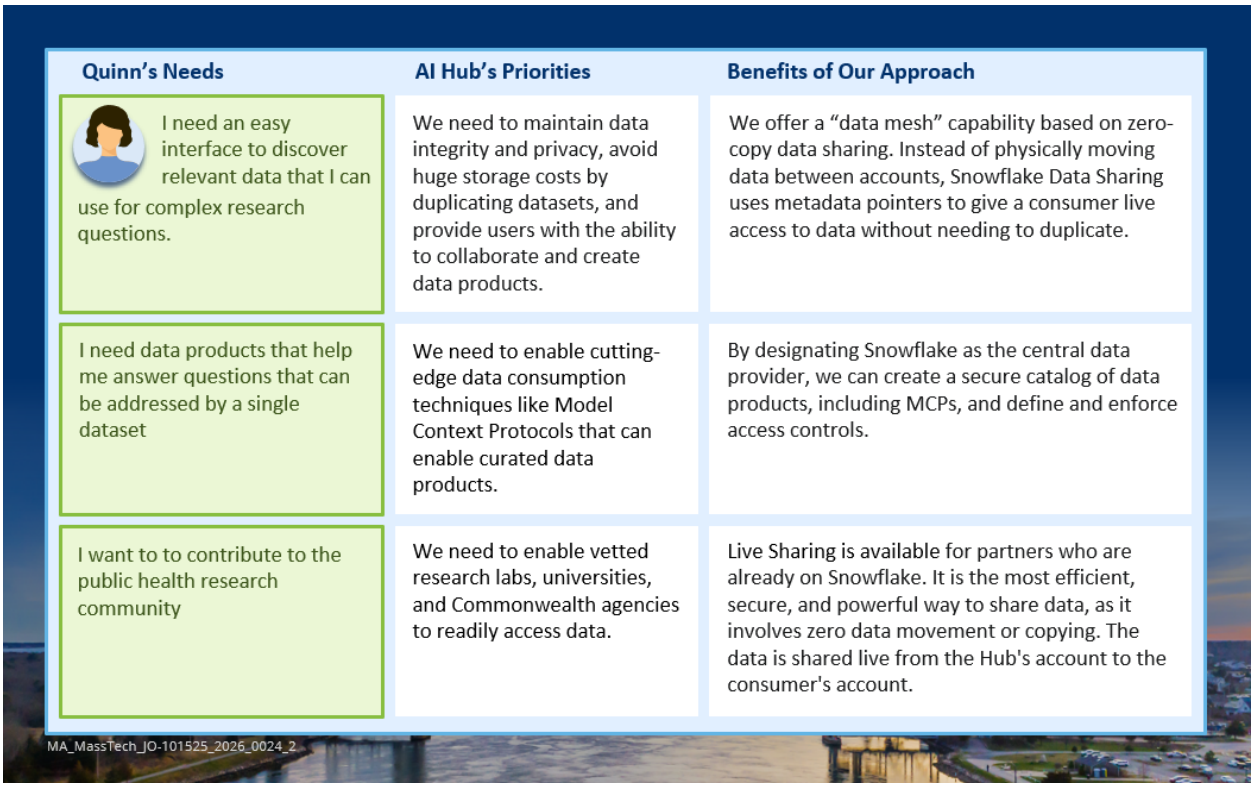
Key DCC Functional Requirement	How We Deliver
External Data Sets and Data Capabilities	• **Cloud-Agnostic, Scalable Architecture:** Deloitte's solution is operable across hosting environments and leverages Snowflake as the secure, central data layer, enabling flexible integration of external datasets from a variety of sources (government, academic, private sector). This strategy supports future-proofing through modular microservices, containerization, and open standards. • **Ingestion, Metadata, and Traceability**: Automated pipelines (Snowpipe, Streams & Tasks) facilitate continuous, policy-driven onboarding of external data. Metadata completeness, FAIR principles (Findable, Accessible, Interoperable, Reusable), and rigorous quality are prioritized.
Website Functionality for Hosted Data Access	• **Human-Centered Design + Modern UX**: The website provides a responsive, accessible user experience, built with React.js, for supporting dataset discovery, search, API-based downloads, and dynamic data previews. Iterative prototyping and real user feedback incorporate usability needs for all profiles. • **API-Driven, Multi-Tier Access**: Data and resources are served via secure, RESTful APIs, supporting direct file downloads, programmatic access, and integration with Snowflake's marketplace, for both public and private data sharing.
Commons Credits System	• **Centralized Ledger for Credits Management**: The Commons Credits system is modeled on proven customer loyalty programs—tracking earning, spending, and redeeming credits for data contributions and usage. • **Automated Rules, Transparency, Equitable Access**: Automated and clear policies govern credit flows (contribution, grant, purchase) and enable rewarding high-value engagement. Administrators and users have dashboards for credit visibility; integration with identity management supports secure, auditable transactions.
Data Catalog and Metadata Management System	• **Snowflake-Based Unified Catalog, Metadata, Lineage**: All data assets are systematically tagged (object tags, sensitive data classification) and registered, supporting deep search, filtering, and lineage tracking via Snowflake's Horizon Catalog and Snowsight Lineage. • **Multi-Channel Discovery + Governance**: Users access comprehensive datasets through intuitive search filters, SQL queries, and programmatic interfaces. Strict governance features include masking, row access policies, and audit trails.
Dataset Curation Plan	• **Use Case-Driven, Agile Curation Sprints**: Data curation aligns with stakeholder priorities; regular collaborative workshops define and refine high-impact AI use cases. Datasets are prioritized, assessed for quality and completeness, and onboarded with privacy safeguards, such as de-identification of PII.

Key DCC Functional Requirement	How We Deliver
	• **Continuous Quality, Feedback Loops**: Ongoing assessments confirm datasets meet diversity, representativeness, and ethical standards. Deloitte's AI Readiness and Management Framework guides rapid, responsible curation and onboarding.
Synthetic Data Generation	• **Snowflake-Based Generation & Validation Pipelines**: Synthetic data zones support privacy-preserving creation of test/training data for AI use cases. Deloitte configures modular pipelines leveraging Snowflake and integrates validation routines for agencies via user-friendly dashboards. • **Governance, Transparency, and User Empowerment**: End users can tag, share, and validate synthetic datasets; strong lineage and audit features support compliance.
AI Fairness and Bias Capability	• **Trustworthy and Secure AI Framework (TSAI)**: Deloitte embeds AI fairness, bias mitigation, and explainability across the AI lifecycle—data assessment, model implementation, and post-deployment monitoring. • **Proprietary Tools and Stakeholder Engagement**: Tools like D.Bias automate bias detection, diagnosis, remediation, and reporting, ensuring auditability and regulatory compliance. Inclusivity and transparency are emphasized.
Governance Requirements	• **Zero Trust Security and Ethical Governance**: Role-based access controls (via Deloitte's access framework), multi-factor authentication, and policy-based approval workflows dictate all data access and platform functionality. • **Transparent Audit Trails, Terms of Use, Policy Management**: Approaches are enforced via deep logging, automated security alerts, incident response coordination, and detailed audit trails. Governance aligns with strategic goals and ongoing stakeholder feedback.
Security and Access Control Requirements	• **Multi-Layer, Adaptive Security**: The solution includes security by design, including encryption of data at rest/in transit, centralized log management, Security Information and Event Management (SIEM) integration. Penetration testing, and vulnerability scanning are core. • **Dynamic, Consent-Aware Authorization**: Deloitte's access framework delivers granular, real-time token-based access validation and supports federated identity management.
Governance Policies and Ethical Guidelines	• **Comprehensive Policy Embedding and Continuous Auditing**: Deloitte enforces clear ethical guidelines—transparency, purpose limitation, data minimization, and security—within all solution layers. • **Enforcement and Education**: Periodic training, documentation, policy refreshes, and oversight mechanisms are deployed to maintain ethical, compliant practices in handling all data.

Making AI a Force for Good by Focusing on People First

Remember Quinn, our DCC user persona who is trying to help Massachusetts better predict health outcomes for underserved populations and families in the child support system? She needs a platform built by a vendor that understands that her experience – as a user, as a researcher, and as a human – is the most important rubric for the DCC's success. She also needs a platform that is built to safeguard against bias and maintain trustworthy standards in AI datasets. Our Requested Services Approach will meet the needs of Quinn and the broader community of DCC users and stakeholders. Here are a few ways that our Requested Services Approach works behind the scenes to meet her needs – and the needs of the AI Hub.

Quinn's Needs and AI Hub DCC Priorities


Quinn's Needs
AI Hub's Priorities
Benefits of Our Approach
I need an easy interface to discover relevant data that I can use for complex research questions.
We need to maintain data integrity and privacy, avoid huge storage costs by duplicating datasets, and provide users with the ability to collaborate and create data products.
We offer a "data mesh" capability based on zero-copy data sharing. Instead of physically moving data between accounts, Snowflake Data Sharing uses metadata pointers to give a consumer live access to data without needing to duplicate.
I need data products that help me answer questions that can be addressed by a single dataset
We need to enable cutting-edge data consumption techniques like Model Context Protocols that can enable curated data products.
By designating Snowflake as the central data provider, we can create a secure catalog of data products, including MCPs, and define and enforce access controls.
I want to to contribute to the public health research community
We need to enable vetted research labs, universities, and Commonwealth agencies to readily access data.
Live Sharing is available for partners who are already on Snowflake. It is the most efficient, secure, and powerful way to share data, as it involves zero data movement or copying. The data is shared live from the Hub's account to the consumer's account.
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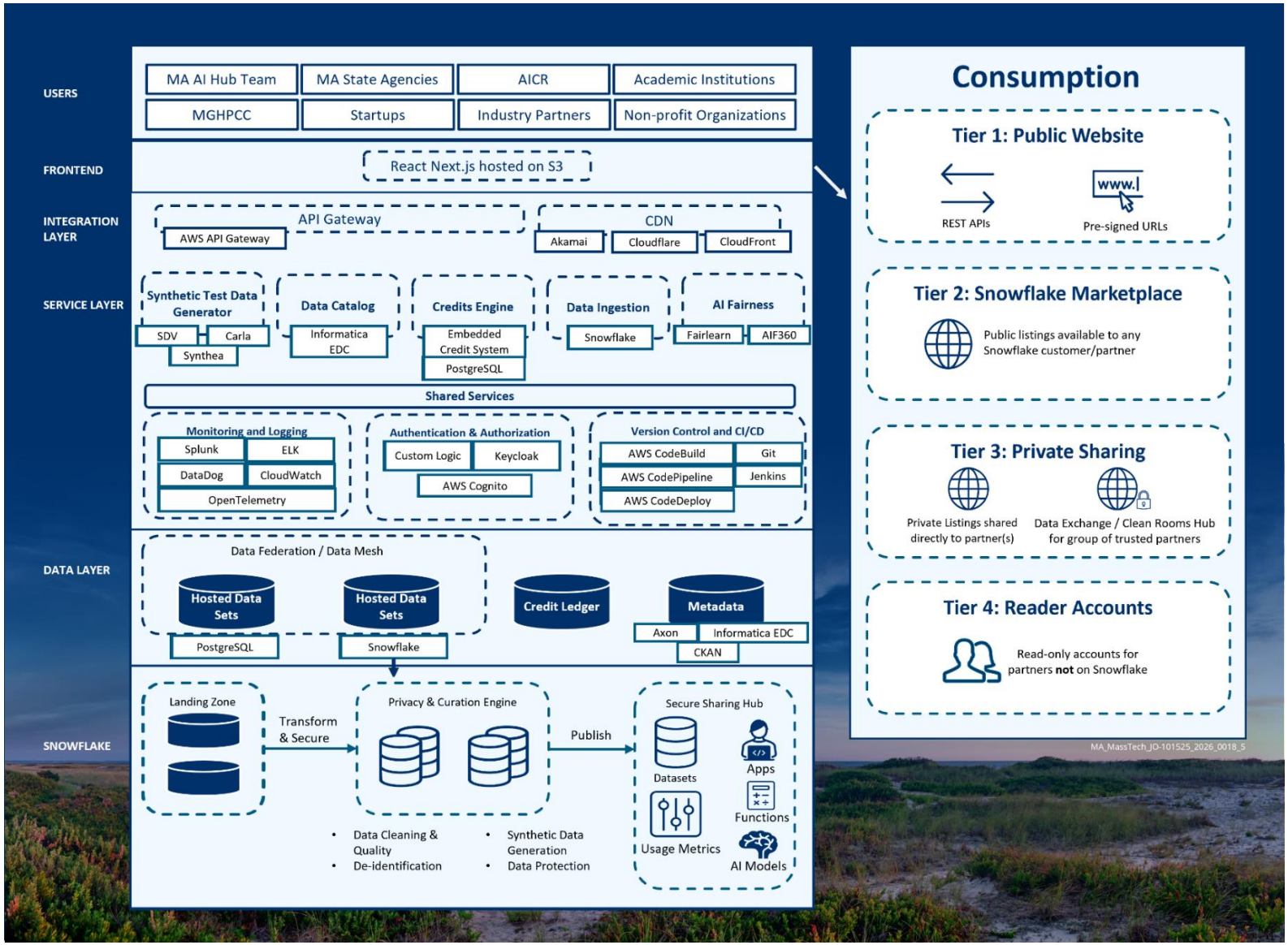
Deloitte's solution for the MassTech AI Hub DCC is anchored in a flexible, scalable, and cloud-agnostic architecture, essential for accelerating AI innovation. Our solution can operate seamlessly across any major cloud platform, including Amazon Web Services (AWS), Azure, Google Cloud, and on-premises environments like the Massachusetts Green High Performing Computing Center (MGHPCC). By decoupling core services and data management from specific cloud providers, we minimize vendor lock-in and optimize for cost, performance, and compliance. We also propose a multi-tiered data consumption strategy that positions Snowflake as the single, secure data layer. This architecture separates the Access Layer (the web application and back-end systems like the Commons Credits Engine) from the Data Layer (hosted in Snowflake), creating a tailored menu of consumption options for every dataset and every partner. This model enables everything from simple file downloads to sophisticated, privacy-preserving collaborative research within a platform that supports consent-driven access management and self-service user actions. In the solution architecture on the next page, we have outlined our vision for the Data Commons platform. For illustrative purposes, we have included tools and services assuming an AWS-based approach – but this solution can be replicated using GCP, Azure, or hybrid/on-prem native services. Our solution architecture layers together public access applications and services with a back-end data platform hosted on Snowflake. This integration is made simple because we follow a standard, well-documented approach:

- The web applications (external and internal portals) can interact with Snowflake using secure REST API endpoints orchestrated through an API gateway.
- The web application's back-end services (e.g., data catalog service, Commons Credits services) can make API calls to Snowflake, which executes the query and streams the data back to the application and user.
- For large files, we leverage Snowflake's ability to generate secure, time-limited pre-signed URLs. The web app requests a pre-signed URL from Snowflake, and the user's browser is then redirected to this URL to download the file directly from the underlying cloud storage (S3), offloading the data transfer from the web server to support high performance and a smooth user experience.

Deloitte's Proposed DCC Solution Architecture



Our cloud-complimentary architecture leverages open standards, containerization, and modular microservices to as a foundation for AI innovation. **We have deep experience in designing and implementing data platforms across all major cloud providers (for example, at the National Institute of Allergy Infectious Diseases, where we built a data platform in AWS, and at the Ohio Bureau of Workers Compensation, where we built a data platform on Snowflake – see Section 5 Past Performance for more details).** We will use this experience to build the Data Commons Collaborative with proven patterns and leading practices regardless of the cloud provider(s) that MassTech chooses to work with. In the table below, we outline core components of the end-to-end DCC solution – the web portal, the Commons Credits Engine, the API integration layer – and illustrate the tools and services available on each CSP.

Deloitte's Proposed Cloud-Agnostic Component Stack

	Key DCC Components					
Potential Platform Providers	**Front-End Web Application**	**Common Credits Engine**	**API Gateway**	**Application Databases**	**DCC Data Platform**	**Identity & Access Management**
AWS	Java React Next.js hosted on S3	Java code & RDS database	Amazon API Gateway	PostgreSQL	Snowflake	Mass.gov login & Cognito
Google	Java React Next.js hosted on Google Cloude Storage	Java code & Cloud SQL	GCP API Gateway	PostgreSQL	Snowflake	Mass.gov login & Firebase/Google Identity Platform
Azure	Java React Next.js hosted on Azure Blob Storage	Java code & Azure SQL	API Management Gateway	PostgreSQL	Snowflake	Mass.gov login & Azure Active Directory
On-Prem (Red Hat OpenShift)	Java React Next.js hosted on MinIO	Java code & containerized SQL database	Hybrid API Gateway	PostgreSQL	Snowflake	Mass.gov login & Keycloak

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Iterative, Use Case-Driven Approach

To enable the Data Commons to quickly deliver value and remain aligned with MassTech's evolving innovation ecosystem, we adopt an iterative, use case-driven approach:

- Working collaboratively with stakeholders, we identify and prioritize high-impact use cases, such as secure data sharing for academic research, real-time analytics for startups, and cross-sector data integration for public agencies.
- Each prioritized use case informs a focused development sprint, during which we design, implement, and validate the necessary architectural components and data services.
- This agile methodology promotes rapid prototyping, early user feedback, and continuous improvement, confirming that foundational elements like data governance, security, and interoperability are established from the outset.
- For an initiative of this size, scope, and complexity, we target a minimum viable product (MVP) portal deployment within 3 months of project kickoff, to enable pilot user feedback and rapid iteration.

Proven Experience and Leading Practices

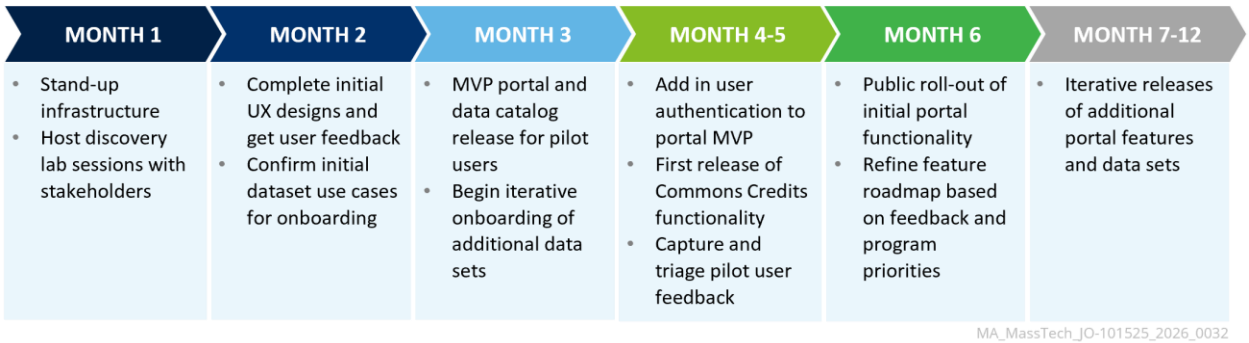
Our approach emphasizes interoperability, portability, and governance, enabling seamless integration with existing systems and rapid adoption of emerging technologies. Here are three ways our solution is differentiated and tailored to the AI Hub's needs:

- **Snowflake Partnership:** Snowflake enables seamless data sharing, advanced analytics, and scalable AI workloads through a secure, high-performance cloud data platform.
  - Deloitte has implemented Snowflake across cloud providers in multiple environments, including in Massachusetts, working with the Department of Public Health (see Section 5 Past Performance for detail).
  - Deloitte is a Snowflake Elite Services Partner and a four-time Snowflake Global Systems Integrator Partner of the Year.
  - Deloitte was named a Snowflake Public Sector Partner of the Year in 2024 and 2025.
  - Deloitte has led 550+ Snowflake-centric engagements globally and have delivered 10m+ hours of consulting services to clients related to Snowflake solutions.
- **Data Commons Delivery and Human-Centered Design Experience:** Deloitte has built numerous data hubs across diverse public sector clients, embedding human-centered design, change management, and cyber security techniques to provide seamless data exploration experiences:
  - Data.ferc.gov provides the public with access to the Federal Energy Regulatory Commission (FERC)'s vast repository of publicly available data. Data.ferc.gov serves as a highly valued data hub for a diverse range of user groups, including the energy industry, researchers, and the general public.
  - DataUSA.io is a first of its kind open-source visualization platform for sharing government data. It provides an open, easy-to-use platform that turns data into knowledge, allowing millions of people to conduct their own analyses and create their own stories about America – its people, places, industries, skill sets and educational institutions. The site receives 600,000+ visits and 1.2M+ pageviews per month.
  - Arpsp.cdc.gov is the home of the Antimicrobial Resistance and Safety Portal, a public data platform designed and built by Deloitte to provide access to critical public health data.
- **Deloitte's Trustworthy and Secure AI Framework:** We are a recognized industry leader in AI safety, responsibility, and management.
  - For example, Deloitte has directly supported AWS, OpenAI, and Anthropic with "red teaming" sensitive frontier AI models to identify potential risks – specifically in the biological engineering space.
  - Our AI Readiness and Management Framework provides a comprehensive data preparation, governance, and operationalization approach for AI applications, embedding ethics, privacy, and security from the start.
  - Our Trustworthy and Secure AI (TSAI) Framework provides models and approaches for validating the accuracy, transparency, and potential bias in datasets and AI models.

We have planned a preliminary 12-month roadmap for the DCC implementation journey, which we have summarized in the table below. During the first two months, we prioritize infrastructure stand-up, hosting discovery lab sessions with community stakeholders to refine scope and priorities, and completion of initial portal and data catalog designs. We plan to deliver the initial MVP of the DCC portal and platform within three months of project kickoff. The scope of this MVP will be narrowly defined to enable rapid iteration based on feedback from a pilot group of users. For example, the initial MVP may not include the fully-fledged authentication solution, instead using a private URL to restrict access to pilot users only. Additionally, the MVP may include an initial subset of potential datasets, focusing on a prioritized set of use cases defined in consultation with DCC stakeholders.

Through the remainder of the first 12 months of DCC implementation, we iteratively build upon the internal and external portal capabilities, onboard additional data sets based on use case priorities, deploy the first releases of core Commons Credits functionality, and continuously capture user feedback and refine the roadmap.

Notional 12-Month DCC Roadmap


MONTH 1
Stand-up infrastructure
Host discovery lab sessions with stakeholders
MONTH 2
Complete initial UX designs and get user feedback
Confirm initial dataset use cases for onboarding
MONTH 3
MVP portal and data catalog release for pilot users
Begin iterative onboarding of additional data sets
MONTH 4-5
Add in user authentication to portal MVP
First release of Commons Credits functionality
Capture and triage pilot user feedback
MONTH 6
Public roll-out of initial portal functionality
Refine feature roadmap based on feedback and program priorities
MONTH 7-12
Iterative releases of additional portal features and data sets
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A major benefit of our partnership with Snowflake is that our early releases, including the initial MVP release, will include capabilities enabled by Snowflake's pre-built proof-of-concept capabilities, like synthetic data generation, automated metadata tagging, search, and diverse consumption options.

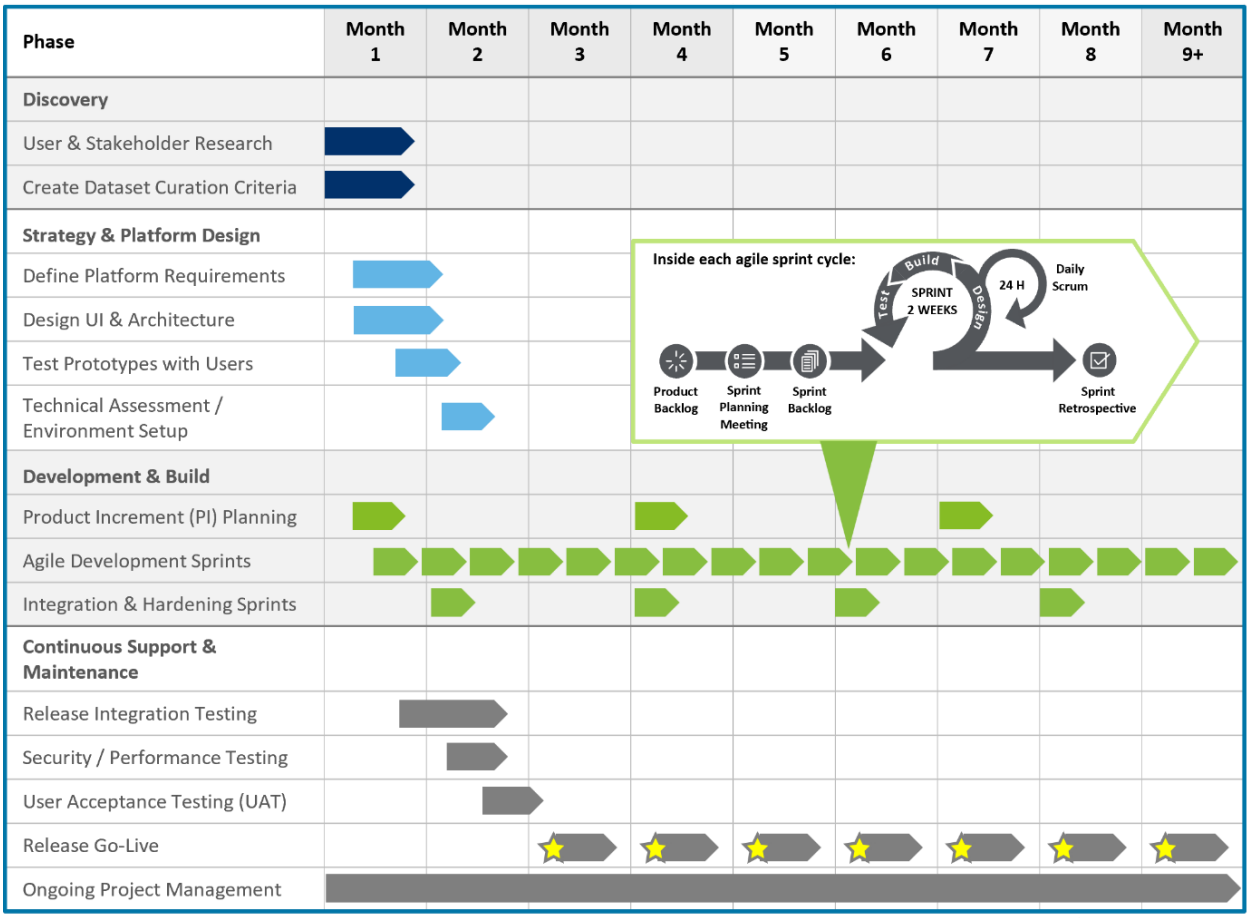
The following sections detail the architectural principles, core components, and operational considerations that will guide the development of a cloud-agnostic data commons, positioning Massachusetts as a leader in AI-enabled innovation.

2.1 Program Management & Coordination

Successful DCC delivery requires active, transparent community engagement across a broad ecosystem, including state agencies and end users. Deloitte's approach embeds agile, human centered design with into our program management activities, prioritizing co-creation, regular feedback, and participatory workshops. This approach will yield a platform that is not only aligned with MassTech's needs but is also compelling, enhancing user engagement and fostering trust.

Below is a representative project schedule, which will be refined at project initiation to provide an initial roadmap of major phases, deliverables, and release waves for the DCC platform. The schedule will be finalized in collaboration with stakeholders to reflect evolving priorities, feedback, and dependencies. As the project advances, the plan will be updated to incorporate input and address emerging requirements. This will be a key artifact that we use to gain and maintain alignment with AI Hub leadership on the end-to-end DCC delivery plan.

Representative Project Schedule



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The AI Hub will benefit from Deloitte's proven success in managing complex public sector programs, such as for the Texas State Health Analytics and Reporting Platform (TX SHARP), which demonstrates our ability to deliver high-quality outcomes aligned with AI Hub's goals.

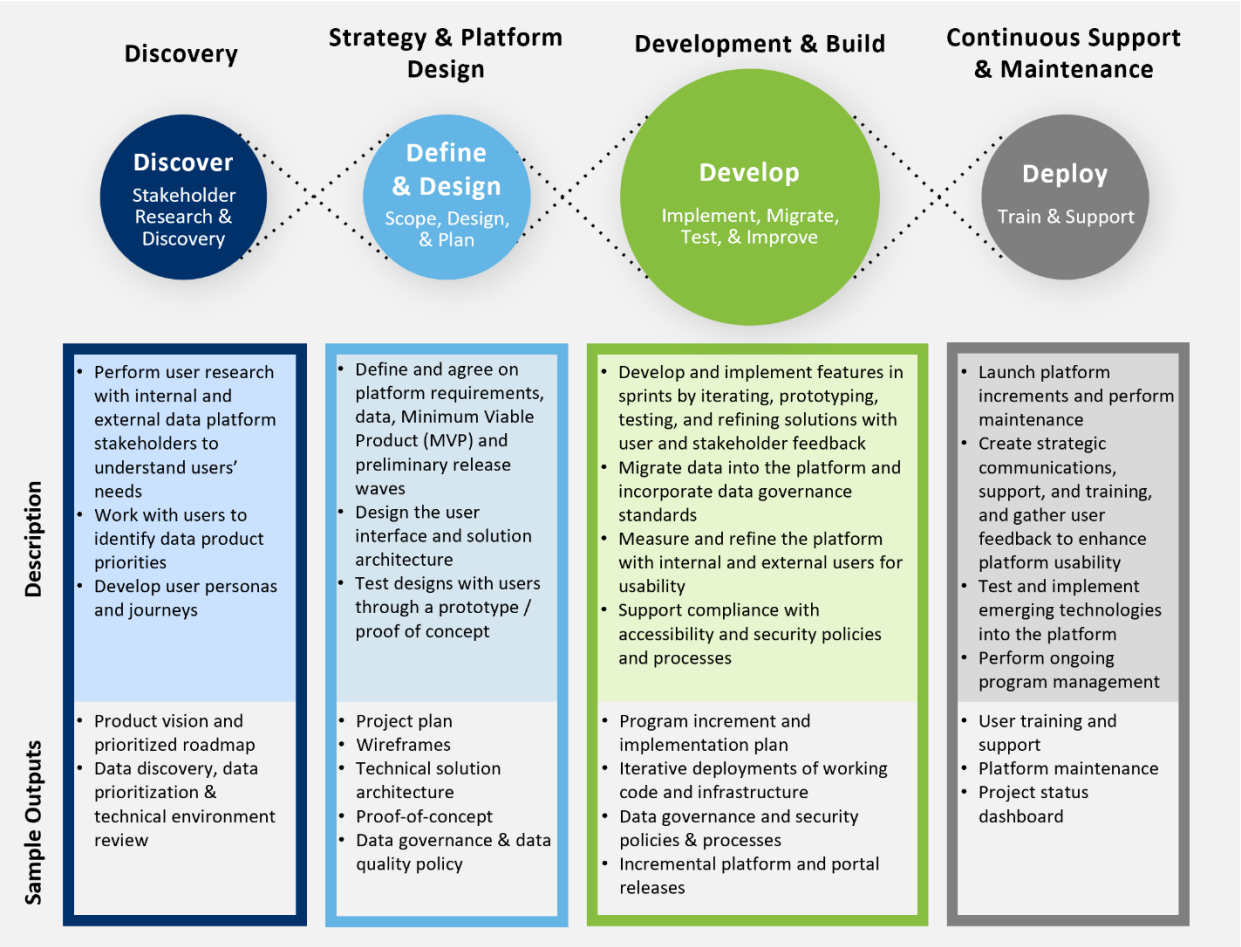
We understand the DCC has a variety of stakeholders and Governance Boards which include members across Executive Branch Agencies and Universities. Deloitte believes that for the DCC to be successful, there needs to be strong stakeholder engagement and input. By integrating stakeholder input throughout the process, we endeavor to establish a product strategy that supports an intuitive, secure, and responsive platform for researchers, government, industry, and the broader Massachusetts innovation ecosystem. Our approach utilizes user insights and feedback to inform every stage of design and development, resulting in a data hub that fosters engagement, trust, and meaningful impact. Deloitte's Discover, Define & Design, Develop, and Deploy Agile project management approach is depicted below. In the proposed notional timeline and later sections, we take a deeper dive into the activities of Deloitte's multi-phased delivery approach.

Deloitte in Action

TX SHARP: Driving Innovation through Collaboration

Deloitte designed and implemented the TX SHARP platform, enabling statewide health analytics for over 29 million Texans. Alongside technical delivery, Deloitte led a robust stakeholder engagement and change management strategy—partnering with the Texas Department of Information Resources and engaging end-users from local health entities and the public. Through interactive webinars, office hours, and a Community of Practice, Deloitte empowered broad stakeholder alignment and user adoption, transforming data-driven decision-making across Texas's health ecosystem.

Deloitte's Agile Project Approach


Discovery
Strategy & Platform Design
Development & Build
Continuous Support & Maintenance
Discover
Stakeholder Research & Discovery
Define & Design
Scope, Design, & Plan
Develop
Implement, Migrate, Test, & Improve
Deploy
Train & Support
Description
Perform user research with internal and external data platform stakeholders to understand users' needs
Work with users to identify data product priorities
Develop user personas and journeys
Define and agree on platform requirements, data, Minimum Viable Product (MVP) and preliminary release waves
Design the user interface and solution architecture
Test designs with users through a prototype / proof of concept
Develop and implement features in sprints by iterating, prototyping, testing, and refining solutions with user and stakeholder feedback
Migrate data into the platform and incorporate data governance standards
Measure and refine the platform with internal and external users for usability
Support compliance with accessibility and security policies and processes
Launch platform increments and perform maintenance
Create strategic communications, support, and training, and gather user feedback to enhance platform usability
Test and implement emerging technologies into the platform
Perform ongoing program management
Sample Outputs
Product vision and prioritized roadmap
Data discovery, data prioritization & technical environment review
Project plan
Wireframes
Technical solution architecture
Proof-of-concept
Data governance & data quality policy
Program increment and implementation plan
Iterative deployments of working code and infrastructure
Data governance and security policies & processes
Incremental platform and portal releases
User training and support
Platform maintenance
Project status dashboard

MA_MassTech_JO-101525_2026_0002_2

1. Develop and Maintain and Integrated Project Plan and Timeline

Co-creation and integrated project planning are foundational to our delivery strategy, engaging a broad community of stakeholders—MassTech leadership, Deloitte teams, external technology vendors, data source partners, compliance teams, government entiries, and end users—throughout the project lifecycle. By combining agile methodologies with project management tools, we facilitate transparent communication, adaptive scheduling, and coordinated execution. This approach enables us to capture evolving priorities, synchronize cross-functional activities, and deliver platform features in iterative waves. Regular stakeholder engagement and continuous plan refinement help keep the solution secure, scalable, and responsive to the needs of the Commonwealth's innovation ecosystem.

We will use GenAI delivery enablement tools within the project management workstream, pending approval and alignment from MassTech, inlcuding M365 Copilot. M365 Copilot is a conversational GenAI solution embedded in Microsoft 365 apps (Teams, Outlook, Word, Excel, PowerPoint, SharePoint) that can streamline preparation for meetings using data from Outlook & Teams, find document links from across M365 (Outlook, Teams, SharePoint), summarize takeaways and action items from emails and meetings, edit content in Word documents. As with all GenAI useage, Deloitte will have the proper waivers from the Commonwealth in place. We will also use a "human at the helm" approach to levearge GenAI as an accelerator but always have team members involved for oversight and accuracy.

Integrated Timeline Development Activities

Capability	Activities	How We Deliver
Stakeholder Mapping & Engagement	• Develop stakeholder ecosystem • Conduct workshops • Document roles and responsibilities	Facilitate workshops and focus groups with representatives from MassTech and other stakeholders identified by MassTech. These stakeholders could include: • Community non-profits • Higher Ed institutions • Local tech startups • Local and State government agencies • Industry players (e.g., biotech, healthcare, or financial firms) These sessions will use structured facilitation and digital collaboration tools to identify stakeholder interests, map influence and engagement needs, and clarify roles and responsibilities.
Integrated Work Plan Development	• Draft Integrated Work Plan (IWP) • Assign resources and responsibilities • Define project milestones	Create plans, with input from MassTech, assign resources based on applicability and availability, set clear and measurable milestones. It will be documented in a shared digital workspace, allowing for collaborative review and real-time updates to reflect evolving priorities.
Project Management Tool Setup	• Configure project dashboards • Train teams on tool usage • Set up reporting formats	Deploy project management tools such as SharePoint, MS Project, and JIRA. configuring dashboards to track progress, risks, and dependencies; setting up automated reporting formats; and providing hands-on training for all participating teams, including MassTech, vendors, and community liaisons.
Cross-Functional Coordination	• Schedule weekly coordination meetings • Review project status • Address integration challenges	Weekly coordination meetings will be scheduled, bringing together technical teams, compliance officers, data partners, and community representatives. The frequency will be revisted as the project matures. Use standardized agendas, specified for the highest priority discussion topics, and collaborative problem-solving techniques (e.g., prioritization activities) to address integration challenges and resolve blockers.
Schedule Refinement & Release Planning	• Update schedule based on feedback • Adjust release waves • Finalize roadmap collaboratively	Use iterative feedback on a weekly basis to refine the schedule, adjust release waves to reflect evolving needs, finalize the roadmap with stakeholders and community representatives. Release planning will prioritize high-impact use cases and confirm that each wave includes opportunities for stakeholder review and feedback before broader rollout.
Agile Delivery & Iterative Implementation	• Conduct sprint planning and reviews • Release features iteratively • Gather and incorporate feedback	Run agile sprints to deliver features incrementally, conduct reviews to gather feedback, incorporate stakeholder input into future iterations. We use retrospective sessions to identify improvements, and each iteration will be documented with clear changes and rationale.

2. Conduct Regular Meetings and Stakeholder Updates

To foster a transparent, collaborative, and inclusive data ecosystem, we conduct regular meetings and stakeholder updates that actively engage both internal MassTech teams and external community stakeholders. Our approach combines targeted outreach, creative communication strategies, and participatory engagement activities to confirm all voices are heard and incorporated. By integrating agile meeting practices, ongoing feedback channels, and opportunities for direct involvement, we build strong relationships, drive alignment, and promote continuous improvement across both internal stakeholders and the community ecosystem for the DCC.

Stakeholder Engagement Activities

Capability	Activities	How We Deliver
Internal Regular Communication	• Status Meetings • Feedback Sessions • Interactive Dashboards	Schedule weekly, or as needed, status meetings to review progress and address concerns, conduct feedback sessions to capture stakeholder input, and maintain interactive dashboards for transparent, real-time updates accessible to all stakeholders.
Internal Agile Meeting Practices	• Daily standups • Sprint planning • Leadership reviews	Hold daily stand ups to confirm team alignment, conduct sprint planning for structured delivery, and organize leadership reviews to assess progress and make strategic decisions.
Internal Decision Tracking and Alignment	• Decision Log Maintenance • Leadership Briefings • Risk and Issue Escalation Forums	Maintain a centralized decision log is and share updates after each meeting, documenting key decisions, rationales, and next steps for reference and accountability. Dedicated escalation forums allow teams to raise and resolve risks or issues collaboratively, providing timely intervention and cross-functional support.
Targeted Outreach	• Identify pilot stakeholders • Focus on operational experts	Engage key users and operational experts for piloting and feedback through structured meetings and surveys, prioritize outreach to those most impacted by platform changes, and tailor communication to their needs.
End User Involvement	• Requirements gathering • Design workshops • Iterative testing	Conduct requirements gathering sessions to capture end user needs, facilitate design workshops for collaborative solutioning, and implement iterative testing to validate features and usability.
Creative and Engaging Communication	• Host town halls, Q&A • Share testimonials • Digital newsletters	Host interactive town halls, Q&A forums, and share user testimonials to build trust and transparency with the broader community. Provide a platform for exciting use case ideation, sharing breakthroughs using the DCC data sets, and highlight accomplishments by Massachusetts users. Digital newsletters and social media updates will keep external stakeholders informed and highlight opportunities for involvement.
Community Engagement	• Participatory workshops • Open feedback channels • Community reporting	Participatory audits and a monthly community advisory panel promote ongoing transparency, guidance, and advocacy for community interests throughout the project lifecycle. A public feedback portal is maintained for continuous input, with submissions reviewed and addressed in stakeholder and other Governance meetings

3. Meet Milestones Defined in the DCC Project Plan

The timeline and risk management strategy is built to support structured progress and proactive identification of potential challenges throughout the project lifecycle. This approach is divided into distinct phases, each focusing on specific activities to optimize project delivery and address risks effectively.

Timeline Management Activities

Phase	Activities	How We Deliver
Initiation: Risk Identification	• Risk assessment workshops • Develop risk register • Estalbish categories	Conduct collaborative risk assessment workshops to proactively identify potential challenges, develop a comprehensive risk register to track and categorize risks, and establish clear risk categories for focused management.
Planning: Timeline Development	• Define milestones • Gantt chart • Resource allocation • Identify critical path	Define project milestones in partnership with stakeholders, build detailed Gantt charts to visualize timelines and dependencies, allocate resources strategically to meet key deliverables, and identify the critical path to enable timely completion of major project phases.
Execution: Risk Mitigation	• Monitor risk indicators • Contingency plans • Regular risk reviews • Adjust plans	Monitor risk indicators continuously using project management tools, implement contingency plans to address emerging risks, conduct regular risk reviews with stakeholders, and adjust project plans as needed to stay on track with milestones and deliverables.

Phase	Activities	How We Deliver
Monitoring: Progress Tracking	• Project management software • Status meetings • Performance metrics	Utilize project management software for real-time tracking and reporting, schedule frequent status meetings to assess progress against milestones, and track performance metrics to enable accountability and early identification of potential delays. Monitor critical path dependencies for key delivery milestones and elevate risks proactively.
Closure: Post-Project Evaluation	• Retrospective • Lessons learned • Update risk framework	Conduct project retrospectives to capture lessons learned, update the risk management framework based on project insights, and prepare a comprehensive outcome report to document achievements, challenges, and recommendations for future initiatives.

2.2 Technical Architecture & Platform Development

The AI Hub DCC will be a user-friendly platform supported by secure, scalable backend infrastructure. The goal is to facilitate the sharing, discovery, and analysis of diverse datasets among AI Hub stakeholders—including researchers, policymakers, and innovators—by providing centralized access to high-quality, curated data. Our architecture separates the Access Layer (the web application) from the Data Layer (Snowflake), allowing the Hub to offer a tailored menu of consumption options for every dataset and every user. This model enables everything from simple file downloads to sophisticated, privacy-preserving collaborative research. Across our delivery lifecycle, our Technical Architecture and Platform Development approach features these differentiators:

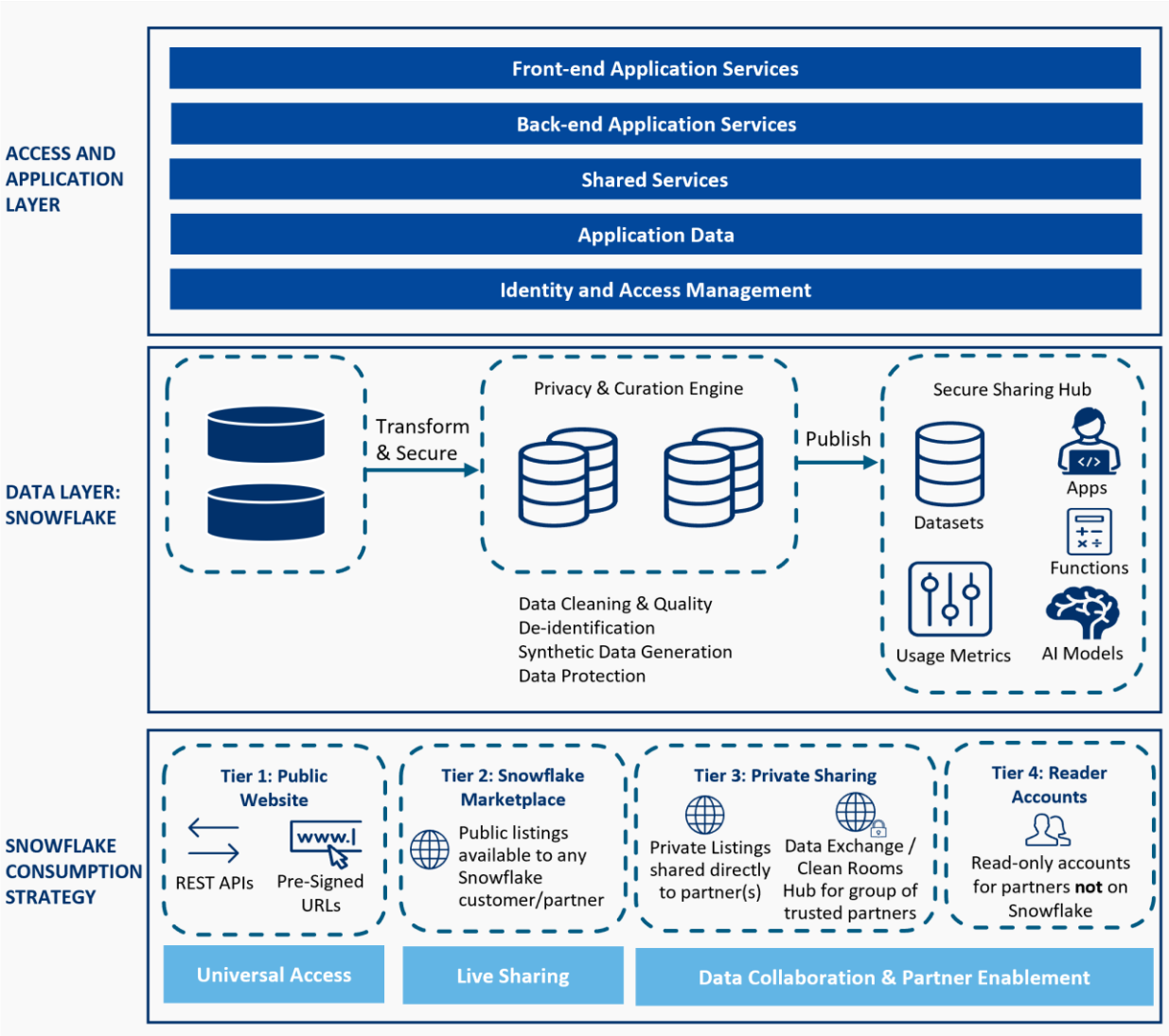
- We engage stakeholders and end users throughout the process, gathering insights into their goals and challenges to shape an intuitive, accessible experience.
- Iterative prototyping and regular feedback guide the refinement of features such as navigation, dataset discovery, and AI data sharing, making the platform effective for a wide range of users.
- Modern web and cloud technologies provide scalability and resilience, with data directories, flexible APIs, and a microservice architecture supporting both immediate needs and future expansion.
- For metadata management and cataloging, we use established standards and tools like Snowflake, allowing data assets to be easily found and governed.
- Role-based access controls and integrated identity management protect sensitive information, while a central ledger transparently tracks Commons Credits to promote participation and equitable access to premium resources.
- Accessibility, security, and extensibility remain priorities throughout development, drawing on experience with large-scale platforms and engagement programs. Thoughtful design, technical rigor, and ongoing collaboration drive a solution that advances MassTech's mission and adapts to evolving requirements.

Core Architectural Principle: Separation of Access and Data

The foundation of our strategy is the clear separation between the Access Layer and the Data Layer. This separation allows maximum flexibility, security, and scalability.

- **Access and Application Layer (Cloud-Agnostic Container Platform):** This user-facing storefront manages user identity, authentication, and request workflows. It handles user registration, role-based access control (RBAC), and presents a catalog of available datasets. This layer is responsible for engaging users and managing their interactions with the data.
- **Data Layer (Snowflake):** This secure warehouse and engine stores, processes, and serves the data. It enforces all data access policies, including masking and row-level security, providing consistent governance rules regardless of how users consume the data. This layer is the system of record and the engine for data governance.

Application and Data Layers



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Our architecture supports a multi-tiered data consumption strategy, providing tailored access options for diverse user needs:

- **Universal Access (File-Based Consumption):** Designed for maximum accessibility, this tier caters to users needing data in traditional file formats for local analysis, scripting, or integration into existing tools. It includes:
  - REST API Download: Provides programmatic, machine-readable access to datasets, ideal for developers and data scientists.
  - Secure Pre-signed URLs: Offers secure, time-limited links for direct, one-time downloads of large datasets, suitable for researchers and analysts.
- **Live Sharing (Snowflake Ecosystem):** For stakeholders already on Snowflake, this will offer the most efficient, secure, and powerful way to share data without data movement or copying. It includes:
  - Snowflake Marketplace (Public Listing): Makes datasets discoverable and instantly accessible to any Snowflake user.

  - Snowflake Marketplace (Private Listing): Provides a private, invite-only share of datasets to specific partners, ideal for restricted or commercial data.
  - Snowflake Organizational Listing: Used to securely share datasets for internal use cases (within MassTech's Snowflake organization).

- **Deep Collaboration & Partner Enablement:** This tier supports strategic partnerships requiring more than simple data access, including:
  - Snowflake Data Exchange: A private, invite-only hub for trusted partners to securely share and collaborate on data.
  - Data Clean Rooms: Highly secure environments for privacy-preserving research, allowing parties to join datasets for analysis without exposing raw data.
  - Reader Accounts: Free, read-only Snowflake accounts for strategic partners not yet on Snowflake, providing live data access without setup overhead.

1. Design and Build the Data Commons Website and Backend Infrastructure

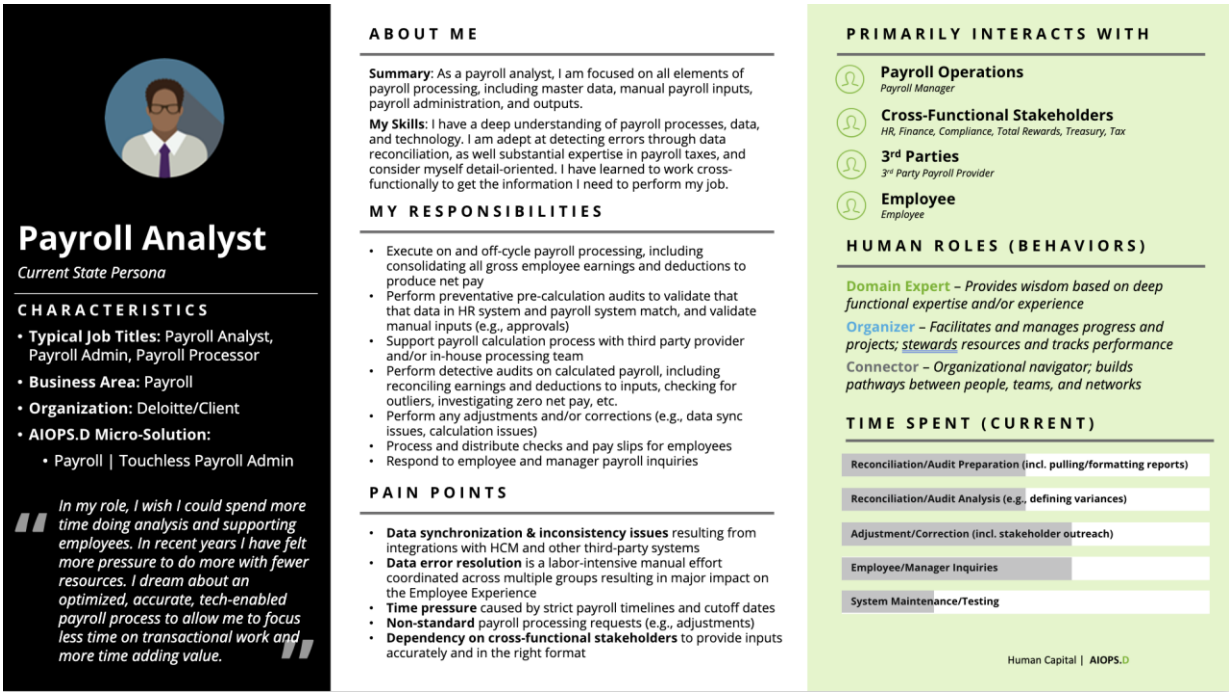
Discovery & Design: At Deloitte, we prioritize human-centered design (HCD) as a foundational approach throughout the discovery and UX (user experience) design phases of website development. This methodology confirms that the end product is intuitive, accessible, and aligned with the real needs of users. This is particularly critical for the DCC where usability directly impacts adoption and effectiveness.

Building Digital Experiences for Taxpayers

Deloitte built the IRS's authenticated taxpayer digital portals, serving individuals, businesses, and tax professionals. The apps and features Deloitte built alongside IRS serve 40+ million users each year and have received multiple Service to the Citizen Awards for excellence in public digital product delivery.

The discovery phase begins with a deep dive into understanding the target users, their goals, and the broader context in which the website will operate. To ground our solution in real user needs, we conduct comprehensive user research and interviews, leveraging AI tools such as Usercue and Outset.AI to accelerate the user research and extract deeper insights. Our research data will be used to develop user personas (like Quinn, the health researcher in Boston), map user journeys and pain points, so that we capture the diverse requirements of data scientists, researchers, and other potential users. See below for a representative example of a user persona template that we use for this part of the design process.

Representative Example of a User Persona



Payroll Analyst

Current State Persona

CHARACTERISTICS

- **Typical Job Titles:** Payroll Analyst, Payroll Admin, Payroll Processor
- **Business Area:** Payroll
- **Organization:** Deloitte/Client
- **AIOPS.D Micro-Solution:**
  - Payroll | Touchless Payroll Admin

"In my role, I wish I could spend more time doing analysis and supporting employees. In recent years I have felt more pressure to do more with fewer resources. I dream about an optimized, accurate, tech-enabled payroll process to allow me to focus less time on transactional work and more time adding value."

ABOUT ME

Summary: As a payroll analyst, I am focused on all elements of payroll processing, including master data, manual payroll inputs, payroll administration, and outputs.

My Skills: I have a deep understanding of payroll processes, data, and technology. I am adept at detecting errors through data reconciliation, as well substantial expertise in payroll taxes, and consider myself detail-oriented. I have learned to work cross-functionally to get the information I need to perform my job.

MY RESPONSIBILITIES

- Execute on and off-cycle payroll processing, including consolidating all gross employee earnings and deductions to produce net pay
- Perform preventative pre-calculation audits to validate that that data in HR system and payroll system match, and validate manual inputs (e.g., approvals)
- Support payroll calculation process with third party provider and/or in-house processing team
- Perform detective audits on calculated payroll, including reconciling earnings and deductions to inputs, checking for outliers, investigating zero net pay, etc.
- Perform any adjustments and/or corrections (e.g., data sync issues, calculation issues)
- Process and distribute checks and pay slips for employees
- Respond to employee and manager payroll inquiries

PAIN POINTS

- **Data synchronization & inconsistency issues** resulting from integrations with HCM and other third-party systems
- **Data error resolution** is a labor-intensive manual effort coordinated across multiple groups resulting in major impact on the Employee Experience
- **Time pressure** caused by strict payroll timelines and cutoff dates
- **Non-standard** payroll processing requests (e.g., adjustments)
- **Dependency on cross-functional stakeholders** to provide inputs accurately and in the right format

PRIMARILY INTERACTS WITH

- **Payroll Operations** — *Payroll Manager*
- **Cross-Functional Stakeholders** — *HR, Finance, Compliance, Total Rewards, Treasury, Tax*
- **3rd Parties** — *3rd Party Payroll Provider*
- **Employee** — *Employee*

HUMAN ROLES (BEHAVIORS)

Domain Expert – *Provides wisdom based on deep functional expertise and/or experience*

Organizer – *Facilitates and manages progress and projects; stewards resources and tracks performance*

Connector – *Organizational navigator; builds pathways between people, teams, and networks*

TIME SPENT (CURRENT)

- Reconciliation/Audit Preparation (incl. pulling/formatting reports)
- Reconciliation/Audit Analysis (e.g., defining variances)
- Adjustment/Correction (incl. stakeholder outreach)
- Employee/Manager Inquiries
- System Maintenance/Testing

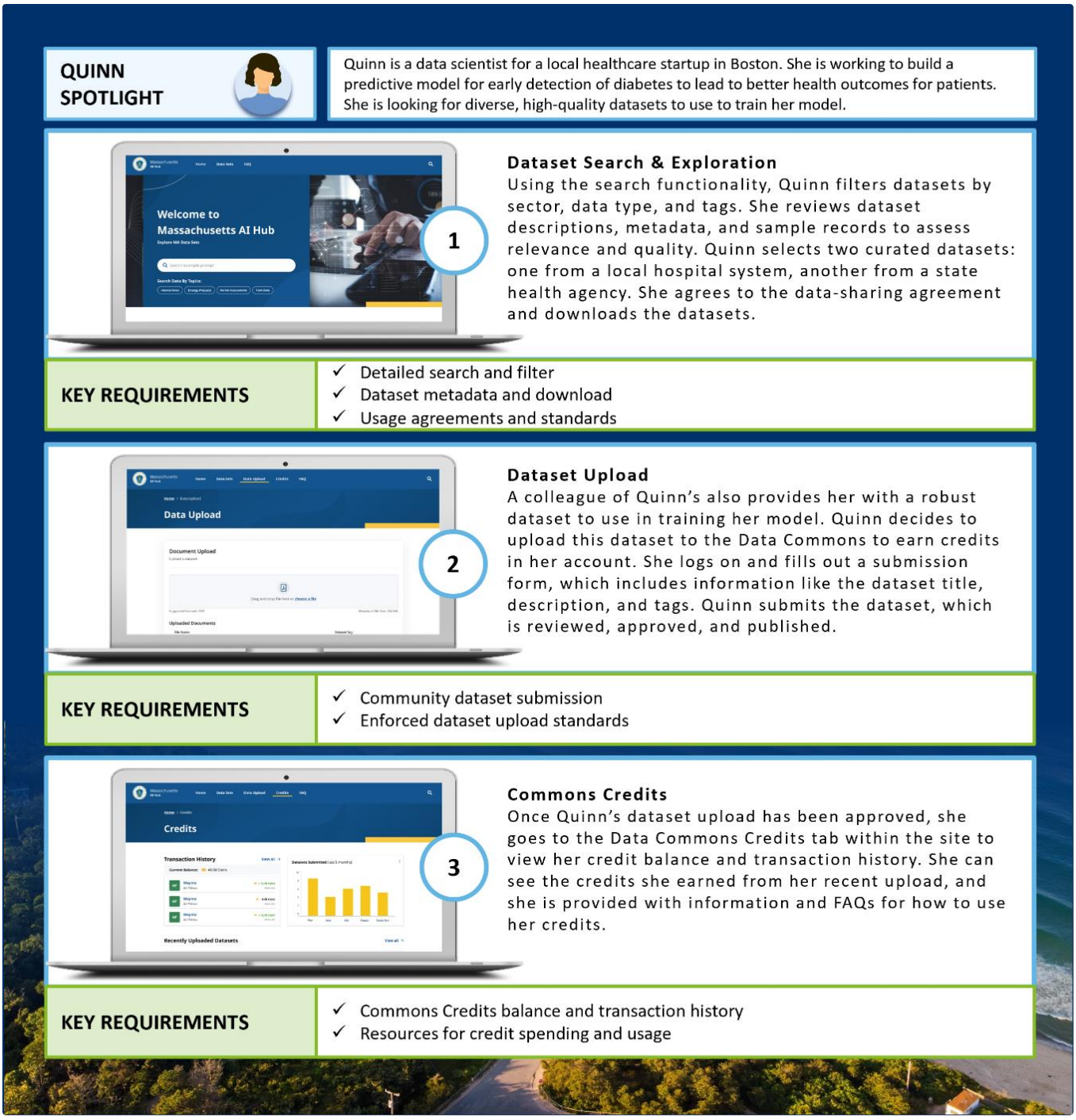
Human Capital | AIOPS.D

We will facilitate a collaborative vision-setting workshop within the first week to validate the AI Hub DCC's goals and seed the initial epics and user-story backlog. The backlog will be groomed regularly as new research, agency input, customer foodback, and lessons learned emerge.

Building on discovery insights, UX designers will craft user personas and scenarios, then iterate from low-fidelity wireframes to interactive mock-ups. We test navigation, search, and download flows with real users in co-creation workshops, folding feedback into each iteration. Accessibility will built in from day one and is embedded into our design standards. We understand how to design and develop for accessibility needs, making the website usable for individuals with varying abilities and backgrounds. We conduct accessibility testing using assistive technologies including screen readers, magnifiers, and voice command software to produce comprehensive test results.

We've already introduced Quinn, a data researcher at a Boston healthcare startup, as a guiding user persona. Let's check back in with Quinn to see how the Data Commons website can support her research goals. Additionally, we introduce Chris, an employee at MassTech, who uses the internal AI Hub Admin portal to maintain and sustain the Data Commons system. The following sample wireframes highlight key points throughout Quinn and Chris' interaction with the site along their respective journeys.

Quinn's Data Commons Journey


QUINN SPOTLIGHT
Quinn is a data scientist for a local healthcare startup in Boston. She is working to build a predictive model for early detection of diabetes to lead to better health outcomes for patients. She is looking for diverse, high-quality datasets to use to train her model.
Welcome to Massachusetts AI Hub
1
Dataset Search & Exploration
Using the search functionality, Quinn filters datasets by sector, data type, and tags. She reviews dataset descriptions, metadata, and sample records to assess relevance and quality. Quinn selects two curated datasets: one from a local hospital system, another from a state health agency. She agrees to the data-sharing agreement and downloads the datasets.
KEY REQUIREMENTS
✓ Detailed search and filter
✓ Dataset metadata and download
✓ Usage agreements and standards
Data Upload
2
Dataset Upload
A colleague of Quinn's also provides her with a robust dataset to use in training her model. Quinn decides to upload this dataset to the Data Commons to earn credits in her account. She logs on and fills out a submission form, which includes information like the dataset title, description, and tags. Quinn submits the dataset, which is reviewed, approved, and published.
KEY REQUIREMENTS
✓ Community dataset submission
✓ Enforced dataset upload standards
Credits
3
Commons Credits
Once Quinn's dataset upload has been approved, she goes to the Data Commons Credits tab within the site to view her credit balance and transaction history. She can see the credits she earned from her recent upload, and she is provided with information and FAQs for how to use her credits.
KEY REQUIREMENTS
✓ Commons Credits balance and transaction history
✓ Resources for credit spending and usage

MA_MassTech_JO-101525_2026_0021_2

Chris's Admin Portal Journey

CHRIS SPOTLIGHT
Chris is an employee at MassTech who works to keep the Data Commons secure and effective by maintaining data quality, security and user access via the AI Hub Admin Portal.
Data Management: Search Results
1
Dataset Management
Chris logs into the internal admin portal and navigates to the dataset management page. He selects an existing dataset flagged for updates, reviews the new documentation and data files submitted by the data architect, and updates the dataset listing on the Data Commons. Chris ensures version control is maintained, and all changes are clearly documented for users.
Dataset Intake
2
Pending Submissions
External Dataset Intake
Chris accessed the intake dashboard, where new datasets submitted by external users await review. He examines a dataset submitted by Quinn to validate completeness, quality, and compliance with privacy regulations. He sees the dataset meets the criteria for acceptance to the Data Commons, and he approves it for publication.
User Management
3
Admin View
Researchers
Administrators
User Management
Chris uses the user management interface to review access requests from AI developers, researchers and MassTech employees. He verifies credentials, assigns appropriate roles and permissions, and periodically audits user activity to promote compliance with platform policies.

MA_MassTech_JO-101525_2026_0021_3

Delivery: We use React.js to create a responsive data commons website that provides seamless integration for all users. Using a modern framework like React.js, will enable us to build a fully custom website that is scalable, maintainable and reliable as the website grows with the addition of new datasets. Dynamic detail pages will display comprehensive dataset information, including metadata, sample previews, and download capabilities for easy viewing and access. We take a user experience-first approach to developing the site, checking in frequently with users and key stakeholders to verify alignment and incorporate feedback.

The back-end will feature Snowflake as the primary cloud-agnostic data platform, supported by technologies like Elasticsearch or PostgreSQL, enabling users to quickly query both labeled and unlabeled data. Using Snowflake is a key part of enabling our cloud provider-complimentary approach, as it can run across multiple clouds. Scalable cloud storage tools will be leveraged to publish datasets, making them accessible through APIs for efficient access and downloads. A microservice architecture (Docker, Kubernetes) with Continous Integration/Deployment(CI/CD) pipelines will support repeatable, reliable deployments.

As outlined below, when providing services, Deloitte may use tools and applications available in the market such as Robotic Process Automation (RPA), AI, cloud, cyber, immersive, and other similar tools and applications as available. These tools and applications may be used for their innovation, efficiency, and ability to enhance our solutions while maintaining a "human at the helm" approach.

AI Delivery Accelerators

Accelerating DCC Delivery with AI	
Requirements Elaboration and Refinement	Deloitte will collaborate with AI Hub stakeholders to understand the desired functionality of the system, then use those insights as input into a GenAI model. By using predeveloped prompts, we extract consistent Epics and User Stories. The model will rapidly parse through vast amounts of texts, such as existing documentation for legacy systems or meeting minutes, to extract relevant information needed to generate initial drafts of Epics and User Stories. Consistency in the Epics and User Stories increases developer efficiency and allows our team to focus on refinement and validation, which ultimately leads to a more efficient and streamlined development process.
UX Design	The initial planning stages of DCC implementation will involve the creation of wireframes, which serve as visual blueprints for the user interface and overall design. By leveraging Gen AI tools, the Deloitte Team will expedite the development of wireframes, generating initial designs based on system requirements and user needs. With these accelerators, we can quickly produce multiple wireframes with different layouts, which will allow for rapid iteration and refinement with AI Hub stakeholders. This not only accelerates the planning and prototyping phases but also creates designs that are both functional and aligned with project objectives.
Technical Code Documentation	Documentation is an essential aspect of the development process, providing necessary context and guidance for future maintenance and development efforts. The Deloitte Team will use AI tools to generate the initial code documentation, so that it is created in real-time as code is written. This not only accelerates the development process but also updates the documentation, so it's reflective of the current state of the codebase. By leveraging AI for documentation, our development teams can maintain a higher level of productivity to write code and maintain detailed documentation.
Code Generation	Deloitte leverages GenAI code generation tools such as GitHub Copilot to accelerate and elevate custom implementation projects. By integrating these AI-powered assistants directly into development workflows, our teams can rapidly generate, review, and refine code, reducing time spent on repetitive or boilerplate tasks and allowing engineers to focus on complex problem-solving and innovation. Copilot translates natural language prompts into usable code, making it easier for developers of all experience levels to contribute, and helps cultivate consistency and quality across the codebase. Our approach incorporates Copilot for a range of tasks—from scaffolding new modules and automating unit tests to refactoring legacy code and integrating APIs. We pair AI-generated suggestions with rigorous human oversight, code reviews, and automated testing, confirming that all output meets Deloitte's high standards for security, compliance, and performance.
Operations and Maintenance	Tracking system defects, resolving code issues, and implementing interim data fixes during Operations & Maintenance (O&M) are crucial steps in maintaining the stability and functionality of an application. Deloitte will use AI-powered tools like GitHub Copilot to identify and track system defects, then categorize based on severity and prioritize defects for resolution. Once defects are identified, we use AI to generate preliminary code solutions that address the root causes of the issues, providing our developers with a head start on the resolution process. In cases where immediate code deployment is not feasible, our team will use AI to generate data fixes that mitigate the impact of the defect in the short term, so the system remains operational to minimize user disruption. By leveraging AI for defect tracking and resolution, we accelerate the time it takes to identify and address issues, reduce manual intervention, and maintain higher system reliability during O&M.

2. Implementing Metadata Management, Data Cataloging, and Discovery Tools (e.g., CKAN, Dataverse)

The AI Hub DCC requires metadata management, data cataloging, and discovery tools to efficiently organize, govern, and make accessible its diverse datasets. Within our proposed Snowflake-based architecture, every data asset will be systematically documented, making it searchable and easily discoverable by both internal and external users. Strong metadata management is critical for data transparency, enhanced collaboration, data-driven decision-making, compliance and security.

Deloitte and Snowflake Delivering Health Insights

When the Tennessee Department of Health needed a secure platform for analytics, research, and knowledge, they engaged Deloitte to build a Snowflake-based solution that streamlines data sharing across the Department by integrating 10+ data sources into a centralized data lake to support disease surveillance, vital statistics, immunization and more. Deloitte also built a Snowflake application (Streamlit) to allow business users to quickly search for golden records, explore record history and hierarchy, and manage records in the system, improving data insights and decision-making to elevate health outcomes and continuity of care for Tennesseans.

Deloitte's strategy for metadata management and data cataloging centers on a unified, user-friendly platform that balances governance and collaboration. Clients choose Deloitte for our unmatched depth of experience, proven methodologies, and record of delivering scalable, future-ready solutions—evidenced by our work on Mass DPH's modernized data platform and the Internal Revenue Service (IRS) Enterprise Data Platform (EDP). Our subject matter specialists have successfully designed and implemented complex data platforms for leading organizations, enabling us to anticipate challenges, and accelerate delivery. More than technologists, we align architectures to business goals and regulatory needs, using agile methods so solutions evolve with new requirements. Deloitte builds solutions that evolve in step with changing requirements and emerging opportunities. Deloitte's development approach is distinguished by a demonstrated track record with large-scale, mission-critical systems, access to SMEs who have done it before, collaborative co-creation with clients, scalable architecture designed for growth and integration, and industry-leading practices for governance and security.

Modernizing Data for Mass DPH

Deloitte and Snowflake worked with MA DPH to create an enterprise data platform, integrate 40+ datasets, and launch data governance capabilities. This highly successful initiative enabled more efficient public health operations and empowered the DPH workforce to create innovative health solutions for Massachusetts.

As a Snowflake Elite Services Partner, Deloitte has nearly 1,000 certified Snowflake professionals with extensive experience in Snowflake implementation and management. We create a scalable data platform tailored DCC user needs:

- Datasets will be organized with clear context about their origin, technical specifications, and licensing, and follow established metadata standards for consistency and future integration. Our solution incorporates Snowflake object tags and sensitive data classification, in alignment with secutity standards set by the MA Chief Information Security Officer (CISO), to standardize business and sensitive metadata.
- Users will have multiple ways to discover and access data, including intuitive search and filtering options and programmatic interfaces that integrate with research and analytics tools. Discovery will be powered by Snowsight search and Lineage, while programatic access will include SQL and Snowpark.
- We incorporate governance features including flexible access controls and comprehensive audit trails. Importantly, Snowflake will remain the single source of truth for data, and native metadata features (object definitions, comments, tags, lineage, usage statistics, etc.) will flow into the metadata platform for catalouging. Additional governace features such as masking policies, row access policies, and access history will be used.

- A continuous ingest and transformation system will be developed using tools such as Snowpipe (for low-latency), Streams & Tasks (for declarative, freshness-based pipelines), and native connectors (Python, JDBC/ODBC). Persistent identifiers on all objects will bolster traceability and extend dataset reach.

We surface rich metadata and contextual information via a central Dataset Directory for each dataset. Contributors will be able to upload datasets, participate in review workflows, and maintain version histories, which helps preserve data integrity. Admin capabilities will streamline dataset management, user contribution tracking, and system health monitoring, directly enabled by the metadata management tool. Additionally, by leveraging open-source components and performance tuning, the catalog will remain responsive and scalable to support future innovation and informed decisions.

MassTech and other stakeholders, such as universities, start-ups, and researchers, can share requirements, documentation, and feedback through secure collaboration portals, scheduled workshops, and recurring stakeholder meetings. Deloitte's engagement model is designed to facilitate knowledge transfer and ongoing communication, so MassTech SMEs are actively involved, and their skills are fully leveraged throughout the project lifecycle.

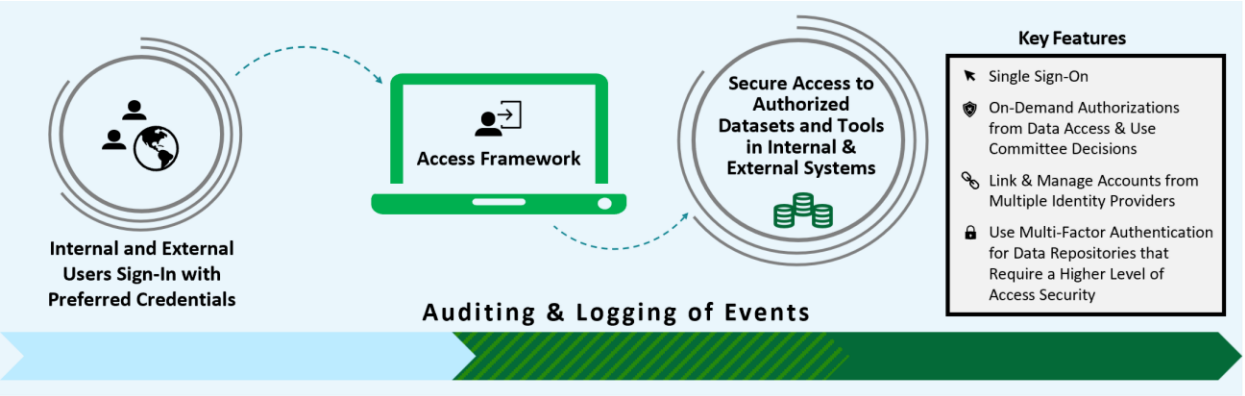
3. Enable Role-Based Access Management

The DCC solution requires a role-based access control system with data access and platform functionality appropriately restricted according to users' responsibilities. To achieve this, the user roles must be clearly defined, such as Public Viewer, Researcher, Curator, and Admin, each with distinct privileges and limitations based on functional needs. Assigning these roles will rely on a formal approval workflow, eliminating inadvertant access to sensitive data or access to restricted datasets without oversight and approval. While the traditional Identity and Access Management (IAM) solutions provide capabilities for role assignment and access request/approval workflows, their capabilties are geared more towards web application security and do not provide a comprehensive framework that can manage fine grained access across a diverse data ecosystem that is foundational to DCC, while also managing the user permissions and consent in a dynamic manner. Deloitte has pioneered an access framework that is specifically designed to address the unique role based access requirements for data ecosystems such as DCC, built on our expience implementing similar solutions for other clients. The access framework helps enable a unified, efficient, and secure authentication and authorization service that enables streamlined access to data resources across multiple systems, and provide standardized methods of logging and auditing such access.

Deloitte in Action

Using our innovative approach to role-based access for data ecosystems, we successfully implemented the Researcher Authorization Services (RAS) at National Institutes of Health (NIH) that facilitates access to NIH's open and controlled access data assets and repositories in a consistent, secure, and use-friendly manner to enable a modernized, FAIR data ecosystem

DCC Sign-On Flow


Internal and External Users Sign-In with Preferred Credentials
Access Framework
Secure Access to Authorized Datasets and Tools in Internal & External Systems
Key Features
Single Sign-On
On-Demand Authorizations from Data Access & Use Committee Decisions
Link & Manage Accounts from Multiple Identity Providers
Use Multi-Factor Authentication for Data Repositories that Require a Higher Level of Access Security
Auditing & Logging of Events

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Please refer to section 2.6 on details of how we implement access framework to enable fine-grained role based access for DCC solution.

4. Develop a central ledger for tracking "Commons Credits"

So far, our user Quinn has been able to log into the Data Commons, quickly use a natural language search to identify datasets that she's interested in, and even upload data to the Commons, earning her some "Commons Credits." Let's see how she uses these Credits to continue her data exploration journey.

Quinn's Use of Commons Credits

QUINN SPOTLIGHT

Quinn's work for a local healthcare startup includes building a predictive model for early detection of diabetes to lead to better health outcomes for patients. Hoer organization is very new but moving quickly, and she wants to be able to use all of the AI Hub's resources to achieve her goals.

QUINN'S USE OF COMMONS CREDITS

1. **Dataset Search & Exploration**
Using the search functionality, Quinn filters datasets by sector, data type, and tags. She reviews dataset descriptions, metadata, and sample records to assess relevance and quality. Quinn selects two curated datasets: one from a local hospital system, another from a state health agency. She agrees to the data-sharing agreement and downloads the datasets.

2. **Dataset Upload**
A colleague of Quinn's also provides her with a robust dataset to use in training her model. Quinn decides to upload this dataset to the Data Commons to earn credits in her account. She logs on and fills out a submission form, which includes information like the dataset title, description, and tags. Quinn submits the dataset, which is reviewed, approved, and published.

3. **Commons Credits**
Once Quinn's dataset upload has been approved, she goes to the Data Commons Credits tab within the site to view her credit balance and transaction history. She can see the credits she earned from her recent upload, and she is provided with information and FAQs for how to use her credits.

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As shown above, we envision a marketplace style solution where users can easily view and select ways to earn credits. For example, a researcher who is lacking grant funding and may need access to a restricted data set could focus their time on data tagging to earn enough credits for advanced data access. They would be able to, after logging on, clearly view their new credit amount upon completion of the work and credits required for advanced data set access. With the click of a button, the credits would be transferred from their account and access granted to the requested data.

Deloitte brings a unique, proven perspective to this aspect of Data Commons delivery. We believe the most similar analog to DCC's requirement for a flexible system of earning, exchanging, and using point-like credits within a digital ecosystem is a consumer loyalty program – like frequent flyer miles or hotel rewards points. Deloitte is an industry leader in the strategic development, transformation, and implementation of these types of points-based credits programs. Successfully implementing credits programs that are intuitive and drive the right type of customer behaviors requires a design-led approach that creates a simple yet extensible set of exchange relationships between users, the platform, and the data they are trying to access. And this is the model will we will use to develop and implement a Commons Credit System for the DCC.

Delivering Credits to 150M+ Hotel Loyalty Customers

One of the world's largest hotel chains partnered with Deloitte to establish their highly successful loyalty points program. We designed and activated their new program across all global channels and touchpoints. Our solution enabled the end-to-end tracking and exchange of customer credits for hotel stays and other purchases.

Based on our experience deploying credit-based loyalty programs and data hubs, we understand the following lessons learned:

- Overly complex rules can confuse users and reduce engagement—simplicity is key.
- Lack of transparency in credit policies can erode trust and participation.
- Early stakeholder involvement improves system design and long-term adoption.
- Continuous monitoring and iterative improvement are essential for sustained success.
- Scalability and extensibility in infrastructure and design will allow the platform to flex and adapt as the nature of services and offerings evolve.

Building a Points Program Based on Crypto Tokens

Deloitte worked with a major Financial Services firm to establish a customer points program based on crypto tokens to drive loyalty, repeat visits, and encourage purchasing behavior . We developed a wallet that can store and exchange multiple loyalty tokens and integrate with client systems. Our solution improved customer and employee retention by enabling new and easy-to-use benefits, while significantly reducing the manual effort involved in running a loyalty credits program.

To create the Commons Credits system, we will first work with the AI Hub leadership to determine high level requirements for the Commons Credit System. It is clear that the inputs and outputs of the credits are well thought through and documented in the DCC requirements. Deloitte's expertise in creating similar systems will be a critical element in determining the value work associated with efforts or pricing to receive credits and the amount of credits required to 'purchase' items.

Working with AI Hub leaders, we will define clear, automated rules for earning Commons Credits, whether through contributions, grants, or purchases. These rules will enable eligibility verification and credit issuance to be both seamless and efficient, incentivizing high-quality data sharing and active participation across the ecosystem. Automation will minimize manual intervention, streamline operations, and reward users for meaningful engagement, thereby driving the growth and vibrancy of the platform.

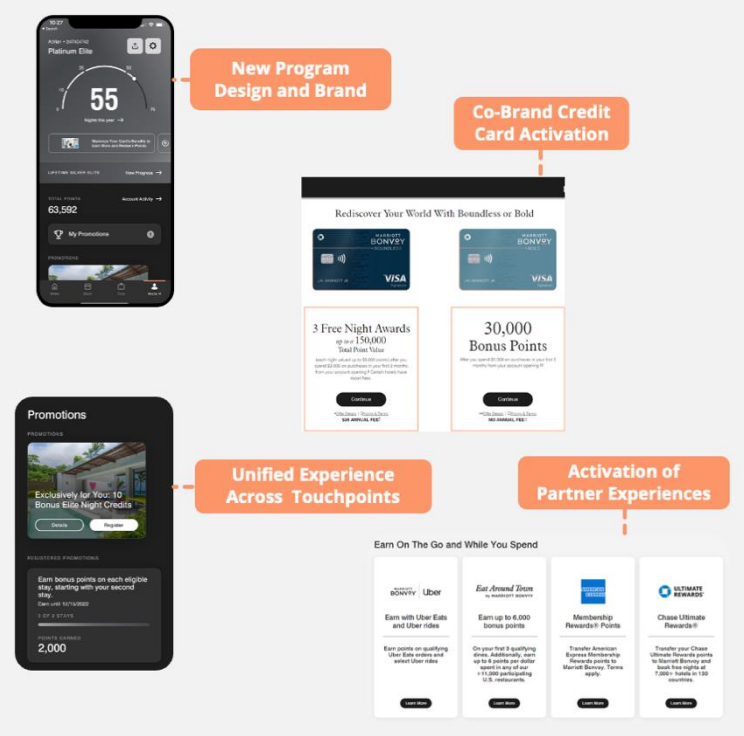
To maximize utility and flexibility, we enable controlled mechanisms for credit spending. Users will determine, based on pre-identified options, how they want to spend accrued credits. They will be able to access premium

resources, deploy AI models, and unlock third-party services, all governed by built-in safeguards such as expiration policies, throttling rules, and tiered access levels. These measures are designed to promote equitable and sustainable use of the platform, confirming that resources are distributed fairly and responsibly.

Our solution will embed governance, reporting, and user experience features. Administrators will have access to an administration portal for policy management and oversight with the capability to make updates without having to deploy new code. Users will benefit from intuitive dashboards and a streamlined portal for credit management. Throughout, we prioritize modularity, security, interoperability, and compliance with data security and privacy standards. The architecture will be designed for future extensibility, including potential integration with blockchain technologies, enabling the Commons Credits system to remain adaptable to evolving needs and innovations. The Common Credits system integrates with our access framework that allows compatibility with existing user and contributor identity management, while enabling dynamic role based access.

We leverage our extensive experience across industries with designing and building pricing models, credits-based loyalty and engagement programs, and blockchain enabled solutions to develop a secure, efficient, and intuitive Commons Credit System that encourages open data sharing, incentivizes platform use, and promotes efficiency and equitable access. As we design the Commons Credits System, we are mindful of the unique and broad sweeping user base that will leverage the platform and deploy a human-centered design perspective to align with the processes and transactions with the needs and behaviors of the intended users.

Transforming a Customer Loyalty Points Experience

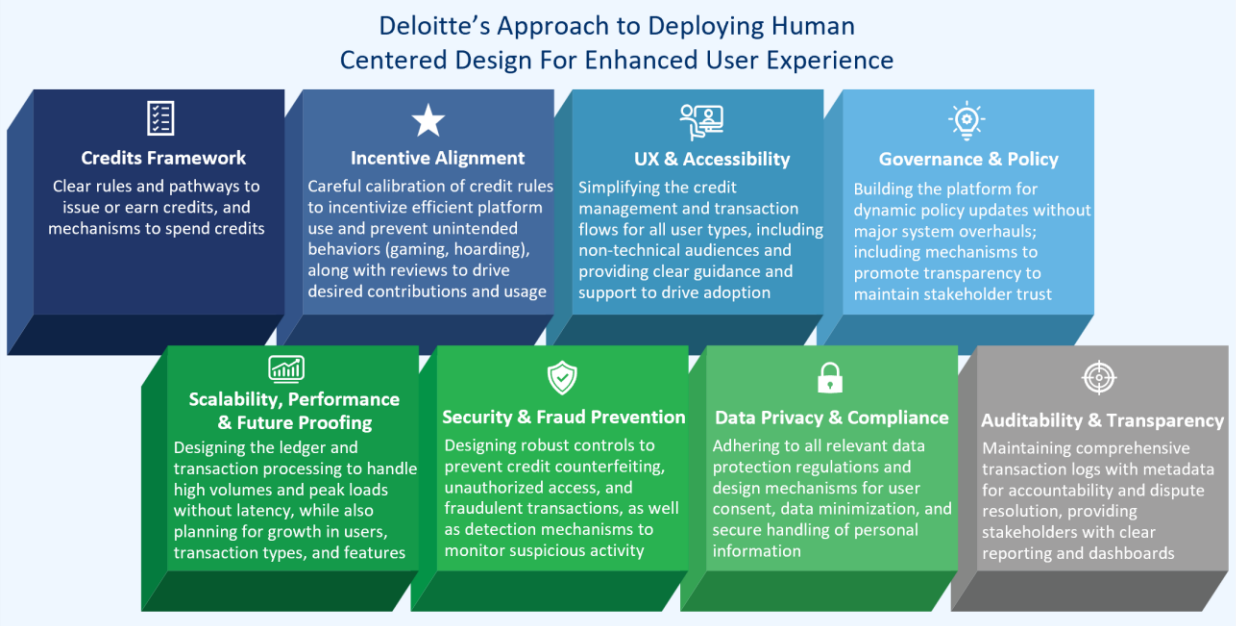

New Program Design and Brand
Co-Brand Credit Card Activation
Rediscover Your World With Boundless or Bold
3 Free Night Awards
30,000 Bonus Points
Promotions
Unified Experience Across Touchpoints
Activation of Partner Experiences
Earn On The Go and While You Spend

Our approach to developing and implementing the Common Credits System will be align with our standard development practices. Key Activities to support effective design, development, and deployment of the Common Credits System include:

- **Requirements Gathering and Stakeholder Alignment:** We conduct workshops with key stakeholders to align on the core vision and desired future experience. We bring examples of credits exchange platforms and transactions from other industries to help generate discussion and collect feedback on top priorities for the Commons Credits System. This will include how external users interact with the credit commons to include incentivizing efficient usage, how administrators govern the policies and modify value of incentives, and view/monitor/generate reports on usage.
- **Architecture & Technology Selection:** Select technical components and design technical architecture that aligns with Data Commons overarching architecture, prioritizing platform security, modularity, user experience, future extensibility leveraging open-source technologies and potential use of blockchain integrations. We will prioritize scalability and adaptability to support evolving ecosystem needs down the line, as new data sets, services, and options for platform use emerge.

- **User Experience Design:** We develop user journey maps and wireframes to illustrate key interactions within the Commons Credits System. Through iterative prototyping and usability testing sessions with representative users, we refine interface elements and workflows to enable intuitive navigation, accessibility, and a seamless experience across devices. Feedback from these sessions will inform enhancements to maximize user engagement and satisfaction.
- **Core System Development & Testing:** Build the foundational components of the Commons Credits System using technologies defined in the proposed architecture and design above. We conduct comprehensive unit, integration, and user acceptance testing to validate functionality, security, and performance. Continuous feedback loops with stakeholders will guide iterative improvements, validating the system is meeting business requirements and is ready for deployment and future scaling.

Human Centered Design for Enhancing User Experiences


Deloitte's Approach to Deploying Human Centered Design For Enhanced User Experience
Credits Framework
Clear rules and pathways to issue or earn credits, and mechanisms to spend credits
Incentive Alignment
Careful calibration of credit rules to incentivize efficient platform use and prevent unintended behaviors (gaming, hoarding), along with reviews to drive desired contributions and usage
UX & Accessibility
Simplifying the credit management and transaction flows for all user types, including non-technical audiences and providing clear guidance and support to drive adoption
Governance & Policy
Building the platform for dynamic policy updates without major system overhauls; including mechanisms to promote transparency to maintain stakeholder trust
Scalability, Performance & Future Proofing
Designing the ledger and transaction processing to handle high volumes and peak loads without latency, while also planning for growth in users, transaction types, and features
Security & Fraud Prevention
Designing robust controls to prevent credit counterfeiting, unauthorized access, and fraudulent transactions, as well as detection mechanisms to monitor suspicious activity
Data Privacy & Compliance
Adhering to all relevant data protection regulations and design mechanisms for user consent, data minimization, and secure handling of personal information
Auditability & Transparency
Maintaining comprehensive transaction logs with metadata for accountability and dispute resolution, providing stakeholders with clear reporting and dashboards

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5. Enable API-Based Data Access and Usage Analytics

API-based data access and usage analytics are foundational capabilities for the MassTech AI Hub Data Commons, and our approach leverages Snowflake as the central data platform to deliver these features with scalability, security, cost efficiencies, and ease of integration. To guide these capabilities and support governance, APIs will adhere to REST principles including SQL API for programmatic queries and external functions, enabling Snowflake and supplemental platforms to integrate with the AI Hub.

For data access, APIs will be designed to retrieve, transform, and deliver datasets to users from Snowflake, as well as supporting approved third-party data providers, community submissions, and automated data ingestion. Select datasets, including user-created and transformed data, will be hosted natively in Snowflake, and, where feasible delivered with no-copy access using Secure Data Sharing, with APIs and export tools enabling direct downloads in formats like CSV, JSON, and Parquet. All datasets will be fully searchable and browsable through the portal, and where direct API access is unavailable, alternative such as secure data pipelines will provide comprehensive coverage. By centralizing data management through APIs and Snowflake, the research process will be streamlined with users directly connected to standardized, machine-readable data from a multitude of trusted sources.

From an analytics perspective, Snowflake's native support for real-time data sharing and analytics enables comprehensive tracking of dataset and model usage, even for services not directly hosted on the AI Hub website. APIs will surface key metrics such as dataset downloads, energy-efficient model deployments and usage, and user engagement on an exportable dashboard to provide stakeholders with actionable insights that drive operational improvements and strategic decision-making.

Our solution, using our access framework for role based access, provides user authorization information to API Gateway in the form of dynamic access tokens that are used to authorize user's access to backend APIs. The access framework is designed to manage and protect APIs through a combination of secure authentication standards and centralized policy enforcement. The key pillars of access framework API management include:

- Authentication and Authorization: Allowing only authorized applications and users to interact with APIs.
- Policy Enforcement: Centralizing access control policies to maintain consistency and compliance.
- Monitoring and Auditing: Tracking API usage and access events for transparency and governance.

Managing API operations through the Gateway will also provide the following benefits:

- Centralized Security: The API gateway enforces authentication and authorization policies at a single point, reducing complexity and the risk of vulnerabilities in downstream services.
- Rate Limiting and Throttling: Controls are implemented to prevent abuse and enable fair resource usage across MassTech APIs using tools such as Snowflake Resource Monitor.
- Traffic Monitoring and Analytics: Detailed logging and analytics facilitate troubleshooting, policy improvement, and regulatory compliance.
- Seamless Routing: The gateway routes requests to the correct backend services, allowing MassTech to evolve its infrastructure without disrupting clients.

This architecture safeguards sensitive data and operations while also paving the way for innovation, collaboration, and growth within MassTech's digital ecosystem.

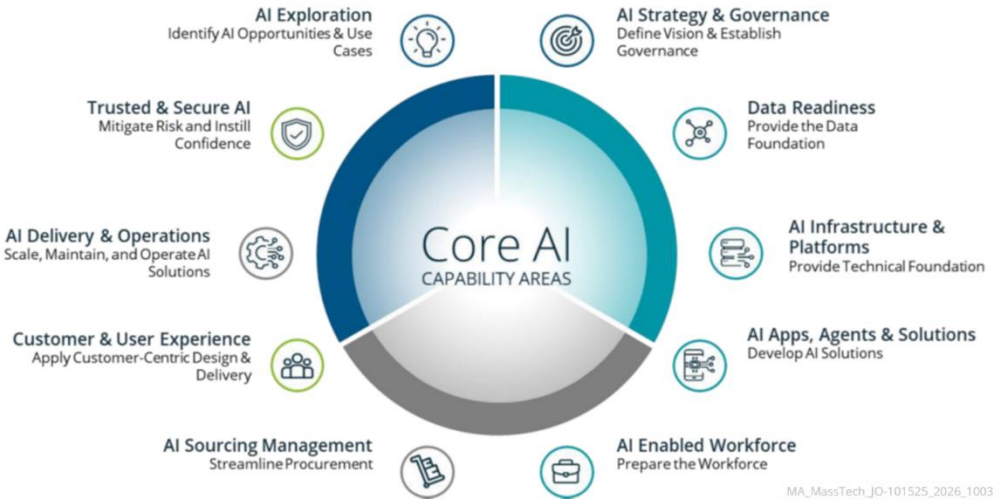
2.3 Dataset Curation and Integration

A centerpiece of our approach to creating the Data Commons is rapid delivery of value through prioritized data product use cases. Working collaboratively with stakeholders, we identify and prioritize the use cases that are most important to our stakeholders and to MassTech's goals, and iteratively curate and integrate data to support those goals. Leveraging Snowflake's cloud data platform, each prioritized use case informs a data sprint, during which we identify, assess, transform, validate, and integrate the relevant data using Snowflake's powerful ingestion, transformation, and sharing capabilities to support user needs related to that use case. This platform-centric approach will enable immediate usability for the Data Commons, early user feedback, and continuous improvement, ultimately driving overall user adoption.

Deloitte's Data Use Case Lifecycle

Let's revisit Quinn's journey through the DCC. Quinn's research is focused on understanding early signals of diabetes in Massachusetts residents. To thoroughly conduct this analysis, Quinn will require data from cross-Agencies, including Departments within EOHSS and research published by Massachusetts based Universities. Deloitte will work with stakeholder groups representative of users, similar to Quinn, to understand their use cases, key goals, and data needed, and prioritize that use case among other stakeholder needs. When a representative group's use case is next on the backlog, we work with the stakeholder groups to identify the public and non-public datasets needed to support successful AI research and innovation. We then assess, validate, and ingest those datsets, following the process described below.

Deloitte's AI Readiness and Management Framework



Our prioritization approach is informed primarily by stakeholder needs but also by Deloitte's AI Readiness and Management Framework (aiRMF), which provides insight and industry-proven guidelines for data management to support common AI use cases. The aiRMF emphasizes the importance of making sure that data is governed, organized, and aligned to startegic goals to support AI, with established governance to deliver practical, scalable, and effective outcomes for the AI Hub. We accomplish this through the following steps:

- Define Data Governance Vision & Goals: Our approach begins by collaborating with AI Hub leadership to define a shared vision for the organization's AI journey and data governance goals, enabling alignment with strategic goals. This foundational step establishes clear, shared goals that resonate with the AI Hub's existing strategy, fostering increased buy-in from key stakeholders.
- Data Maturity & Assessment Portfolio Analysis: Next, we conduct a comprehensive assessment prioritizing emergent AI use cases, we create a baseline for AI Hub's capabilities and capacity, along with a plan to improve data governance for the overarching AI strategy.
- Data Governance: We define clear success measures and establish a baseline for the current state of data governance and align this within MassTech's existing governance structure. Collaboratively, we develop a change management strategy to achieve the target state of data governance that will underpin a successful data strategy for the AI Hub.
- Deloitte's approach to AI Strategy & Governance empowers the AI Hub by defining a clear vision, aligning goals with existing strategies, establishing governance, and creating an operational model that accelerates AI adoption and maximizes value realization across the enterprise. Deloitte's services, tools, and accelerators to support this work area, include an AI Governance Playbook that has been deployed across hundreds of clients.

1. Assisting in Curating the Initial Set of Datasets

Our methodology is designed to accelerate AI research and innovation by rapidly making high-priority datasets available for use. As depicted in the use case lifecycle figure above, our approach involves close collaboration with AI Hub leadership, academic institutions, industry partners, and other key stakeholders to identify the primary use cases that MassTech envisions the AI Hub being able to support across lifesciences, robotics, education, and healthcare. This collaborative approach is critical to curating datasets that are relevant, impactful, and representative of the diverse needs of the Data Commons Collaborative.

As described above in our project management approach, we establish regular working group meetings of interested stakeholders to share our approach and collaboratively refine a use case prioritization rubric. For top priority use cases, we use a sandbox with Snowflake zero-copy cloning to enable rapid experimentation while providing cost control. We bring significant experience creating dataset and use case prioritization approaches, such as working with the Internal Revenue Service to prioritize forms for digitization, based on factors including political implications, the volume of submissions, relevance to tax code, and seasonality of form submissions. We understand that an out of the box prioritization approach (such as high impact/low effort) is unlikely to meet the needs of MassTech's diverse stakeholder group, and will gather inputs on priorities and needs through a variety of methods, including facilitating interactive workshops, survey data, and benchmarking against other similar innovation acceleration efforts.

Deloitte's Differentiated Approach

Collaborative, Stakeholder-Driven Use Case Prioritization: Deloitte partners closely with AI Hub leadership, academia, industry, and other stakeholders to identify and curate high-impact datasets through interactive workshops, surveys, and regular working group meetings. This inclusive process ensures diverse needs and priorities are reflected in the use case backlog and refined prioritization rubric.

Rigorous Data Assessment and Governance: Each dataset is evaluated for storage suitability, quality, completeness, and bias using frameworks such as AI Ready Data Management and Trustworthy AI. Governance processes are followed to address errors or biases collaboratively, documenting these clearly for user awareness and compliance.

Comprehensive Data Preparation for AI Acceleration: Datasets undergo privacy safeguards (like PII de-identification and masking), standardization, normalization, and thorough quality assurance. Technical processes leverage Snowflake's advanced ingestion and cloning capabilities to enable rapid, cost-controlled experimentation and seamless onboarding for innovation initiatives.

Once use cases are prioritized, we rank them in a backlog that is consistently available for users and leadership to review. For nonsensitive use cases, we will work with MassTech to create an interactive backlog that AI Hub stakeholders can vote on to update the backlog of use cases in response to changing needs or emerging issues. Our approach yields a high-level study design to identify the inputs (data, models) needed for each use case to produce useful outputs (findings, insight) and validate that study design in regular stakeholder engagement meetings. When Deloitte and AI Hub stakeholders have a shared understanding and alignment on the datasets needed and available to support a given use case, it can move into a data assessment and ingestion sprint.

Deloitte in Action

State of TX AI Governance Framework
The client was challenged with reporting critical data in a timely manner. Deloitte developed and deployed a cloud-based analytics solution that efficiently ingested data from multiple source systems to meet real-time and near-real-time needs. We also worked with the Agency to enable a governance framework for decision-making rights, defining roles and responsibilities, and aligning stakeholders with data quality procedures and standards.

We assess each dataset to understand requirements, including where it should be stored, what quality and completeness challenges the data may have, and what metadata should be created to support future use of the data. We understand that MassTech envisions a mix of storage options for datasets, including some hosted by the AI Hub and some remaining in external repositiories. We create a checklist

of questions for each dataset to understand where it should be stored, including its size, how frequently we expect the data to be accessed, whether it is likely to change frequently, and the senstivity of the dataset. Based on the results of this checklist we recommend ingesting the data or linking to an external repository. We also bring a data quality assessment approach grounded in the AI Ready Data Management Framework, which includes conducting exploratory data analysis to identify the completeness of the data, whether it contains duplicates or nulls, and confirming that categorical fields conform to the expected sets of values. We assess the data against the Trustworthy AI Framework described in section 2.5, which includes existing standards and metrics for understanding datasets from a fairness, transparency, and accountability perspective. For example, datasets related to Massachusetts residents may significantly mislead modeling efforts if they are not representative of all socioeconomic strata in the state, so we assess each dataset to understand whether they may introduce bias into AI efforts. For each dataset, we work with the dataset owner and primary use case stakeholders to determine whether any errors or biases should be addressed before ingestion or left as-is and noted in metadata and governance documentation for user awareness.

The figure below depicts how this journey looks from the user's point of view, as we check in with Quinn.

QUINN SPOTLIGHT

DATA PRIORITIZATION JOURNEY
Quinn has been engaged throughout the process of data prioritization, joining stakeholder advisory calls, voting on prioritized use cases, and suggesting open-source datasets that can be included in the Data Commons. Quinn also shared one of her own research datasets to be included in the Commons, and answered a questionnaire about its completeness, potential sources of bias, and how often it is updated.

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Snowflake supports several methods of data ingestion, depending on the source, size, and update schedule for the data in question. We will create a standard criteria to evaluate each dataset in conjunction with Snowflake SMEs to determine how to best ingest the data and build a refresh approach, including via the front-end UI, low-latency streaming data through Snowpipe, and the Snowflake COPY function for batch ingest and update.

To prepare datasets for onboarding into the DCC platform, our approach includes data cleansing and transformation activities. This includes the de-identification of personally identifiable information (PII) to aid privacy and compliance, which can be accomplished in several ways depending on the use case. We have worked with clients to protect and de-identify data through data masking, tokenization, and encryption, which may be needed for very sensitive data sets; we can also implement differential privacy and k-anonynimity approaches for data sets that need enhanced privacy. As we implement these approaches, we will check that data format is preserved, as well as the data's referential integrit, consistency, and uniqueness through automated data check pipelines and human review. We have implemented this approach at a state department of health, to support data sharing with academic institutions – an extremely similar use case as those envisioned by the AI Hub. In addition to de-identifying data, we will also standardize and normalize data formats for seamless integration, and conduct comprehensive tests and quality controlto verify completeness and accuracy prior to onboarding. PII will be auto-classified and tagged (object tags) with tag-based masking policies and row access policies.

Deloitte's approach is designed to accelerate the development of the Data Commons Collaborative, confirming that MassTech is equipped with high-quality, compliant, and actionable datasets to drive innovation and research.

2. Metadata Completeness and Adherence to FAIR Data Principles

Our approach includes a strong focus on metadata completeness and strict adherence to the Findable, Accessible, Interoperable, Reusable (FAIR) data principles. We aim to make all datasets discoverable, usable, and compliant with industry leading practices, supporting both transparency and traceability throughout the DCC platform:

- **Enforces FAIR Data Principles and Metadata Completeness:** All datasets are made discoverable, accessible, and interoperable by leveraging automated cataloging, persistent identifiers, and thorough metadata documentation within Snowflake.
- **Integrated Data Governance and Security:** Standardized naming, automated privacy tagging, and security controls maintain high-quality, secure, and compliant data assets, supported by real-time auditing and continuous validation.
- **Continuous Quality Assurance and Operational Insights:** Ongoing metadata audits and automated profiling deliver consistent, accurate, and actionable datasets, empowering stakeholders with transparency, traceability, and operational visibility across the Data Commons Collaborative.

Deloitte in Action: Cancer AI Alliance Federated Learning

Deloitte supported the October 1, 2025, launch of the **Cancer AI Alliance (CAIA) federated learning platform**. In just one year, this alliance of cancer centers, researchers, and technology collaborators came together to build something the industry has been working toward for a decade.

The platform enables machine learning that lets cancer centers work together and share insights without individual clinical data ever leaving their own secure systems. As each institute shares insights, it makes the models smarter, helping researchers spot patterns across millions of data points to speed up discoveries in cancer research.

We harness Snowflake's technical architecture to deliver automated capture and management of technical metadata—including schema definitions, table structures, column data types, and cross-platform dependencies and register all appropirate datsets with Snowflake Horizon Catalog with Snowsight Lineage. This enables end-to-end data lineage, full traceability, and version-controlled object history, supporting seamless auditability and governance. We configure Snowflake to provide detailed access logs and change audit trails for all database events.

Deloitte's Snowflake implementations integrate business glossaries and data cataloging to maintain standardized naming, enriched definitions, and flexible classification of data assets. Our methodology supports seamless automated tagging for privacy, regulatory, and business mapping purposes, tying technical metadata directly to business terms, processes, and policies. This comprehensive documentation guarantees that all datasets are thoroughly described, facilitating efficient discovery and evaluation by users. For operational metadata, Snowflake's native tools provide real-time visibility into data usage, performance, and process orchestration, empowering stakeholders with actionable insights for compliance and operational improvement.

We rigorously enforce the FAIR data principles across the Data Hub using Snowflake's native data governance features. For findability, each dataset will be assigned persistent identifiers, such as Digital Object Identifiers (DOIs), along with rich metadata to enable efficient cataloging and discovery. We clearly define RBACs and integrated identity management to protect sensitive information within the Data Layer of Snowflake. Object-level and column-level security will be implemented to limit access to specific tables and other data structures. We promote interoperability by enforcing standardized formatting and structure both within the data itself but also to related metadata, schema definitions and documentaion. Snowpipe ETL workflows will automate data validation, transformation, and loading to confirm each batch follows expected formats before entering the production data hub. We also tag data data objects with format descriptors to standardize metadata, enabling seamless integration and compatibility across diverse datasets within the platforms. For reusability, detailed provenance, licensing, and usage information will be provided for each dataset, supporting responsible and informed reuse by researchers and stakeholders.

To maintain high standards of data quality, our approach includes conducting ongoing metadata quality assurance through regular audits. We employ Snowflake's integrated data profiling and validation capabilities to continuously assess key data quality dimensions, such as completeness, consistency, and accuracy, on all ingested datasets. Automated alerts and dashboard reports will be configured to surface anomalies—such as missing values or out-of-range entries—enabling rapid issue resolution and ongoing monitoring. These structured and repeatable audits verify metadata completeness, accuracy, and consistency across all datasets in the Data Commons Collaborative, supporting continuous improvement and compliance with organizational and regulatory standards.

Deloitte in Action

Demonstrated Data Governance Success: North American Rail Client

Deloitte supported a North American rail client in establishing an enterprise data governance program using Informatica's IDMC platform to modernize data management and drive transformation. The team catalogued over 3,000 data assets, applied 300+ quality rules, and enabled business users with self-service access to trusted data through the IDMC Data Marketplace. Deloitte also implemented automated data lineage and AI-powered metadata discovery using CLAIRE Copilot, reducing manual effort and accelerating delivery. These efforts streamlined data access, improved data quality, and positioned the client to scale enterprise-wide data and AI initiatives.

3. Supporting Ingestion Pipelines, Version Control, and Provenance Tagging

We will architect and implement a scalable, automated data ingestion pipelines designed to onboard both structured and unstructured datasets from a wide array of sources, including government agencies, research institutions, and industry partners. Our methodology makes data onboarding, management, and sharing more efficient, transparent, and auditable, supporting the collaborative's goals for data-driven innovation:

- **Scalable, Automated Data Ingestion:** Architected pipelines seamlessly onboard structured and unstructured datasets from diverse sources, leveraging Snowflake tools for efficient, standards-based integration and real-time updates.
- **Transparent Governance and Security:** Embedded data lineage, version control, and access management support full auditability, reproducibility, and secure sharing of high-quality data assets across the collaborative.
- **Semantic Alignment and Operational Trust:** Source data is mapped to industry-standard ontologies, thoroughly validated, and tagged with provenance for transparent traceability—supporting trustworthy, compliant, and impactful AI-driven innovation.

Leveraging Snowflake's native capabilities such as Snowpipe for real-time streaming ingestion, Tasks and Streams for change data capture and scheduling, and External Tables for handling semi-structured data like JSON, Parquet, and Avro, we enable seamless, policy-driven integration of diverse data assets. Our solution supports flexible workflows, enabling both real-time and batch ingestion to facilitate initial bulk onboarding as well as ongoing incremental updates, confirming that the DCC remains current and relevant. Our architecture incorporates Snowflake's Data Marketplace for controlled, permissioned access to public and private data, supporting efficient internal collaboration and external partnerships. Pipeline orchestration will be managed using Snowpark, allowing for custom data transformations and scalable compute. All data onboarded is validated and profiled using automated quality checks, with status and lineage tracked in Snowflake's Account Usage and Information Schema views.

To maintain transparency and reproducibility, we embed version control mechanisms throughout the Snowflake Data Layer. These controls will track dataset updates, changes, and historical versions, allowing users to access detailed logs and histories of all modifications. This change tracking supports auditability and provides rollback capabilities whenever needed.

We begin development of the ingestion pipelines by gathering detailed requirements around business use cases to guide data integration efforts. The team identifies the relevant domain-specific ontologies (e.g., HL7, FHIR, DCAT) and vocabularies for each use case and then maps every source data field to these standards to enable semantic alignment. Next, necessary data transformations, such as standardization, normalization, and enrichment, are designed and applied along the pipeline. Throughout every step, provenance tags are systematically added to each dataset and transformation, capturing granular lineage metadata. This process enables MassTech to transparently trace the origin, history, and context of data from its source to final consumption, greatly enhancing trust and accountability.

According to the governance processes outlined in 2.6, we will establish governance and documentation standards for data ingestion, transformation, and publication, all aligned with Deloitte's data governance ethos. The Datahub will incorporate user-level permissions and access controls, enabling secure and compliant data sharing across the collaborative while safeguarding sensitive information.

By implementing these capabilities, our team allows the DCC to efficiently onboard, manage, and share high-quality datasets with full transparency, traceability, and security—laying a strong foundation for AI innovation and collaboration across the Commonwealth.

2.4 Synthetic Data Capability

We understand the AI Hub's vision to power the DCC platform with next generation capabilities by integrating synthetic data generation capabilities using tools such as Snowflake, ensuring users can create and use synthetic datasets with confidence across diverse analytic and AI use cases.

- **Establish a Secure Foundation:** Our approach for establishing synthetic data capabilities is grounded in a collaborative, secure, and scalable framework that focuses on stakeholder engagement, seamless integration, embedded testing, comprehensive governance, and unwavering compliance.
- **Build Upon Proven Patterns:** We leverage proven methodologies and deep experience to configure and seamlessly integrate Snowflake's synthetic data generation capabilities to enable secure scalable and secure data creation, develop synthetic data generation and validation pipelines that allow for end users to confidently generate, test and leverage synthetic data for identified use cases and adhere to privacy, security and audit requirements, embedding goverance and transparency throughout the synthetic data lifecycle.

The sections below highlight the activities that will be conducted to establish comprehensive synthetic data integration capabilities.

Integration of Synthetic Data Generation Tool

To integrate synthetic data generation tools, we will collaborate with MassTech to identify and convene cross-functional stakeholder groups—including agency leadership, data owners, privacy officers, and analytics teams—to establish a shared understanding of the MassTech's data landscape and strategic objectives. We will facilitate structured workshops to gather insights to define the core data flows and synthetic data requirements that are aligned to analytic, testing and data sharing needs. Our team will then document these findings in a requirements matrix which will serve as the foundation for integration activities. By mapping source schemas, business rules, and required synthetic data characteristics, we will align with MassTech's vision and mission. We will use the outputs of these discovery sessions to prioritize the list of synthetic data tools and use cases (e.g., Snowflake native tools, CARLA Simulator, Synthia, NVIDIA Omniverse).

Once requirements are captured, we will begin the integration of Snowflake's synthetic data generation capabilities. We will leverage native Snowflake features, including Snowpipe, Streams and Tasks to configure

dedicated synthetic data zones, secure pipelines, and orchestration for automated refresh cycles and cross-environment sharing. We will then architect the solution to be modular, supporting new data sources and schema extensions, and integration with internal API endpoints and ETL tools to enable interoperability.

Fueling AI Innovation with Synthetic Test Data

At the FDIC, we drove the development of unstructured or semi-structured test data for statistical signature matching production data or data matching 3rd party SaaS providers to support AI/ML model training and GenAI deployments (e.g., rule interpretation).

Synthetic Dataset Generation and Validation Pipeline

Deloitte understands that synthetic data is highly valuable to users, especially where there is a sparse dataset available or when high volume analysis will support mission objectives. Our standard is to embed validation within each step. Data lineage is captured through Snowflake's metadata and automated logging, while advanced dashboards provide real-time monitoring of pipeline health and validation outcomes. CI/CD is employed to confirm pipelines are agile, easy to update, and resilient as requirements evolve. In a recent project with a state transportation authority, Deloitte built Snowflake-based pipelines that automatically validated synthetic traffic flow data for urban planning models, ensuring datasets were both analytically rigorous and privacy-compliant. This was viewed as a major win for that agency to increase safety amongst constituients.

We also support user empowerment by enabling agency staff to execute validation routines independently through user-friendly interfaces or invoked workflows, with clear guidance generated by Deloitte's data scientists. This enables distributed teams to confidently deploy synthetic datasets for testing, analytics, and policy simulations—all backed by rigorous, transparent validation processes.

Our experience in deploying synthetic data solutions for public sector clients enables us to recommend best-fit tools, optimize workflows, and verify that each use case is supported by a scalable synthetic data generation platform.

Security, Privacy, Compliance and Audit Comprehensive Evaluation of Synthetic Data Generation Tools

At the core of our framework for the DCC is Snowflake's native synthetic data generation capabilities. Snowflake offers secure, scalable, and feature-rich solutions that are well-suited to meet the majority of the Hub's data generation requirements, providing strong integration with established workflows, extensive auditability, and comprehensive privacy controls. Its robust support for structured and semi-structured data—combined with built-in data security features and native pipeline orchestration—enables us to address the Hub's synthetic data needs with confidence in both compliance and operational efficiency.

For the majority of identified use cases, we rely on Snowflake's rigorous data governance, built-in access controls, and support for privacy-preserving techniques as our baseline for security, privacy, and auditability. Snowflake's extensive auditing and monitoring capabilities—such as automated lineage tracking, metadata capture, and real-time usage logging—enable transparent oversight and responsive compliance management across the synthetic data lifecycle, from generation to consumption.

However, we recognize that new or highly specialized requirements may arise throughout the DCC's evolution—such as high-fidelity image, sensor, or geospatial data, or scenarios demanding advanced synthetic data algorithms not yet native to Snowflake. In these instances, Deloitte follows a structured, risk-aware evaluation process to select supplemental synthetic data generation tools that align with the Hub's high standards for security and compliance.

Our process includes:

- **Fit Assessment:** We begin by benchmarking both Snowflake and potential third-party tools against the DCC security and privacy requirements, including technical alignment with the existing data hub architecture and compliance with relevant federal and state standards (e.g., HIPAA, GDPR, CCPA, FERPA).
- **Test-Environment Validation:** Candidate tools are deployed in secure, sandboxed environments that mirror production conditions. We evaluate not only data fidelity and performance, but also each tool's ability to support fine-grained access controls, log synthetic data activities, and enable traceable audit trails.
- **Collaborative Review and Governance:** Deloitte experts co-develop evaluation criteria with MassTech's security, privacy, and data stewardship leaders to confirm all tools meet agency-specific mandates around consent management, data minimization, and risk mitigation.
- **Transparent Reporting:** Each evaluation culminates in a comprehensive report detailing our findings—covering strengths, technical gaps, compliance considerations, and recommended next steps. Final tool selection is driven by a commitment to security, privacy, and continuous auditability, with the flexibility to adapt as MassTech's analytic landscape evolves.

Throughout this process, Snowflake remains the anchor platform, allowing for operational consistency and minimizing tooling sprawl. Supplemental tools are introduced only when justifiably required, with rigorous controls and governance to maintain sustained compliance. This balanced, needs-driven approach confirms synthetic data solutions for the DCC remain secure, auditable, and compliant—supporting the commonwealth's innovative use of AI with trusted, high-quality data.

Implementation of Synthetic Data Tools

Once a comprehensive evaluation is completed, we work to design and develop integration solutions that embed synthetic data generation tools (Snowflake native tools and/or non-Snowflake solutions) into the existing hub infrastructure, leveraging APIs for real-time data exchange, ETL pipelines for batch processing, and orchestration frameworks for workflow automation. Our design strategy is modular and extensible, enabling rapid adoption of new tools and minimizing disruption to ongoing operations. Implementation activities include developing custom connectors, configuring data pipelines, and establishing monitoring dashboards to track synthetic data generation and usage. We work closely with MassTech to verify that integration is secure, reliable, and aligned with existing data governance policies. Integration testing is conducted to validate end-to-end workflows and check that synthetic data tools operate seamlessly within the hub ecosystem.

We develop automated test suites that validate data integrity, schema consistency, and analytic performance for both batch and real-time workflows. These tests simulate production workloads, monitor data lineage, and detect anomalies in synthetic dataset generation. We establish continuous integration/continuous deployment (CI/CD) pipelines are established to support rapid iteration and deployment of synthetic data workflows. Automated alerts and dashboards provide real-time visibility into workflow health, enabling proactive issue resolution and ongoing optimization.

2.5 AI Fairness and Bias Framework

Implementing a fairness and bias framework is critical for the high level of research and analysis that will be conducted on the DCC by a variety of users. Take Quinn, for example, and her research on early indicators of diabetes. She needs a series of data sets that, as a researcher for a start-up, she trusts are fair and do not contain bias which would inevitably impact the quality of her work.

Addressing AI fairness and bias is not a one-time exercise but an ongoing commitment that spans the entire AI lifecycle—from data acquisition and model development to deployment and monitoring. By embedding fairness

and bias mitigation into governance structures, technical workflows, and stakeholder engagement, the Data Commons can proactively identify and address potential inequities before they impact outcomes. These measures can have significant impact on user adoption, as we can see with Quinn:

QUINN SPOTLIGHT

THE IMPORTANCE OF AI FAIRNESS & BIAS

Quinn is particularly interested in fairness, as studies on chronic illness have often overlooked key demographics. She is unlikely to use any datasets from the Data Commons unless she understands how its fairness and bias is being measured. After reviewing the AI Hub's Fairness and Bias Framework, reviewing the datasets she's interested in, and understanding the metadata, tagging, lineage, and potential sources of bias, Quinn is confident that the datasets on the Commons meet her needs and are unbiased enough to be used for her critical research.

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True AI fairness requires more than technical checks; it demands a human-centric approach that respects individual rights and societal values. This means designing systems that empower users, enhance transparency, provide clear channels for accountability and redress, and minimize potential '*unfair and deceptive*' application of AI systems. Two critical components in this process are explainability and inclusivity:

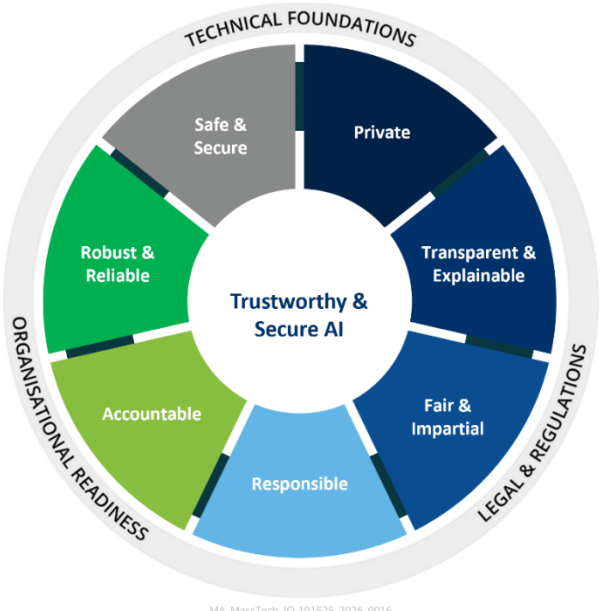
- Explainability helps stakeholders understand how decisions are made and to challenge those decisions when necessary.
- Inclusivity in data, model development, and governance can reduce the risk of systemic bias and foster equitable access to AI's benefits.

We advocate for continuous stakeholder engagement, cross-sector collaboration, and open dialogue to surface new perspectives and drive collective progress.

By leveraging advanced tools, leading practices, and a flexible platform architecture, the Data Commons can support responsible experimentation while minimizing environmental impact. This allows Massachusetts to position itself as a leader in ethical, sustainable, and forward-looking AI innovation.

The DCC will be built with ethical, secure, and equitable use of AI in mind through implementation of our Trustworthy and Secure AI (TSAI framework. TSAI will be used to monitor DCC data products and solutions for fairness and bias, and detect and address inequities proactively. The TSAI framework is designed to help the AI Hub navigate the complex landscape of AI risks, particularly those related to risk, security, bias and fairness. Our methodology encompasses the holistic AI lifecycle, from initial data assessment through ongoing post-deployment monitoring, and is built to align with regulatory requirements and MassTech's values of inclusivity and transparency.

Trustworthy and Secure AI



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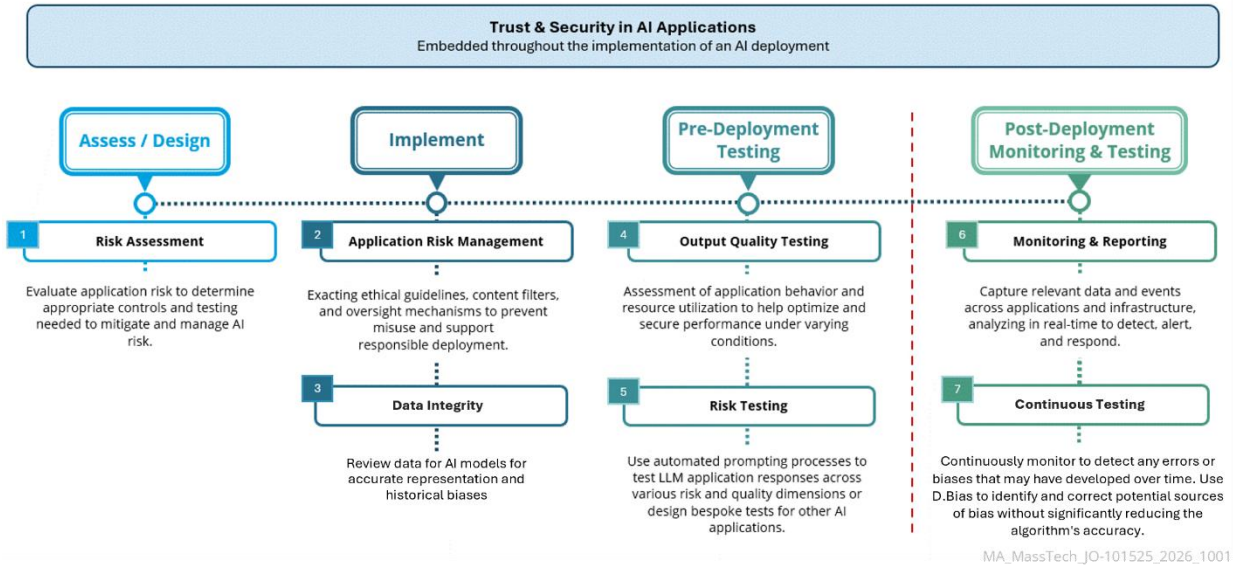
Trust & Security in AI Applications


Trust & Security in AI Applications
Embedded throughout the implementation of an AI deployment
Assess / Design
Implement
Pre-Deployment Testing
Post-Deployment Monitoring & Testing
1
Risk Assessment
Evaluate application risk to determine appropriate controls and testing needed to mitigate and manage AI risk.
2
Application Risk Management
Exacting ethical guidelines, content filters, and oversight mechanisms to prevent misuse and support responsible deployment.
3
Data Integrity
Review data for AI models for accurate representation and historical biases
4
Output Quality Testing
Assessment of application behavior and resource utilization to help optimize and secure performance under varying conditions.
5
Risk Testing
Use automated prompting processes to test LLM application responses across various risk and quality dimensions or design bespoke tests for other AI applications.
6
Monitoring & Reporting
Capture relevant data and events across applications and infrastructure, analyzing in real-time to detect, alert, and respond.
7
Continuous Testing
Continuously monitor to detect any errors or biases that may have developed over time. Use D.Bias to identify and correct potential sources of bias without significantly reducing the algorithm's accuracy.
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Deloitte employs a four-step process to evaluate AI and Gen AI applications, supporting trustworthiness, security, and alignment with ethical standards. This process is designed to identify and mitigate potential risks throughout the AI lifecycle:

- **Assess / Design:** We begin by evaluating AI application risks to determine the security controls, compliance requirements, and testing protocols. This includes identifying potential biases, privacy concerns, and vulnerabilities. We evaluate the legal and regulatory landscape of the organization and create guidelines and guardrails to adhere compliance.
- **Implement:** During implementation, we focus on managing application-specific risks and securing the data used in models. This involves implementing data governance practices, encryption, access controls, and privacy-enhancing technologies to protect sensitive information. We review data used to train AI models to check if it accurately represents the relevant population and is free from historical biases.
- **Pre-Deployment Testing:** Prior to deployment, we conduct output quality and risk testing to optimize and secure performance. This includes evaluating model accuracy, fairness, robustness, and resilience against adversarial attacks.
- **Post-Deployment Monitoring and Testing:** Following deployment, we continuously monitor and test AI applications to detect and respond to emerging vulnerabilities, performance degradation, drift, and evolving threat landscapes. This includes ongoing model validation, anomaly detection, and security assessments. Continuous monitoring allows detection of errors or biases that may not have been apparent during training or that develop over time due to new data or changing environments. Deloitte's proprietary tools, such as D.Bias, are used to identify and correct potential sources of bias without significantly reducing the algorithm's accuracy. These tools help in detecting potential hidden risks and fairness issues in algorithmic systems.

Chris is one of the key users who participates in ongoing monitoring and testing, making use of the D.Bias framework and automated dashboards created by the Deloitte team, as shown below.

CHRIS SPOTLIGHT

CHRIS'S BIAS MONITORING TOOLS

Chris has received an automated alert and logs into his AI Bias Monitoring Dashboard. MassTech has received a data set for a workforce development program, and initial analysis reveals that the data overrepresents applications from urban areas, potentially disadvantaging rural communities. The TSAI dashboard flags this imbalance, and Chris works with the AI Hub and Deloitte to supplement the data with additional records, either through synthetic data creation or enhanced data collection. The dataset is then audited and tagged to confirm that when it is used, the resulting outcomes, such as program eligibility or resource allocation, are equitable across all regions. Throughout this process, tools like D.bias are continuously monitoring and displaying outcomes on Chris's dashboard, addressing new biases as data evolves and is used in a real-world setting.

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Our approach addresses governance, privacy, transparency, bias, accountability, reliability, and security throughout the AI lifecycle. By implementing these measures, our approach provides MassTech with the confidence that their AI initiatives are not only innovative but also trustworthy.

Active Bias Monitoring and Management

At the heart of the TSAI framework is a process for identifying, flagging, and remediating bias in data sets, models, and applications. For example, when a new data set is submitted for use in a business grant eligibility model, our team will first conduct a thorough bias assessment. This involves analyzing data for historical or systemic inequities, such as underrepresentation of minority-owned businesses or geographic disparities in access to resources.

To do this, we use D.Bias, a Deloitte proprietary AI bias assessment and mitigation platform. It's designed to help organizations systematically detect, measure, and address bias in AI models and data pipelines. D.Bias reduces manual work and human error, applies a consistent, standards-aligned methodology, helps organizations meet legal obligations by proactively demonstrating fairness evaluation and remediation, and guides practical next steps for bias mitigation. The tool provides bias assessment and mitigation by covering the core functions below:

Bias Assessment

- Automated Scanning: D.Bias scans datasets and model outputs using advanced algorithms to flag biased patterns (e.g., differences in prediction accuracy, disparate impact across groups).
- Fairness Metrics: The tool applies statistical tests like demographic parity, equal opportunity, and more to quantify bias.

Diagnostics & Visualization

- Dashboards: Users get intuitive visualizations that make bias findings tangible and easy to interpret, such as group-wise performance or "heat maps" of feature sensitivity.
- Root Cause Analysis**:** D.Bias highlights which variables or stages in the data pipeline may be driving observed bias.

Mitigation Recommendations

- Playbooks and Protocols: D.Bias offers evidence-based remediation tactics—such as dataset balancing, algorithmic tweaks, or output adjustments—that users can apply.
- Scenario Simulation: Users can simulate effects of various interventions to see how they impact overall fairness and model accuracy before deploying changes.

Governance and Audit Readiness

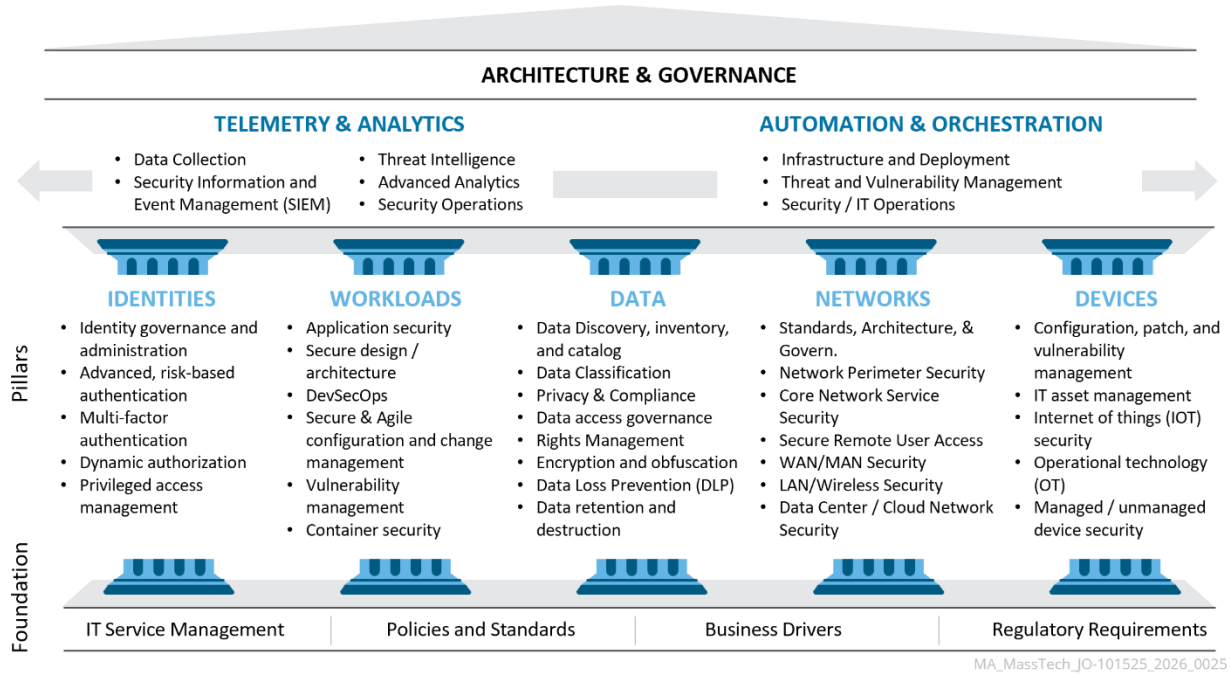
- Documentation: Every bias analysis, remediation, and decision is logged automatically, supporting auditability and regulatory compliance.
- Reporting: The tool produces customizable outputs for compliance filings, stakeholder reviews, or internal governance.

With the support of Deloitte's proven TSAI framework and proprietary bias assessment and mitigation tools, the DCC will operate fairly and ethically, providing the citizens of Massachusetts with faith in the trustworthiness and security of the AI models and their underlying data.

2.6 Security, Governance & Compliance

AI initiatives introduce new complexities and cyber risks, including expanded attack surfaces, sensitive data handling, and dynamic system interactions. The AI Hub requires a zero trust approach to enable protection for AI-driven environments. Zero trust is a modern cybersecurity framework that assumes no user, device, or application should be trusted by default—regardless of their location within or outside the network. Instead, every access request should be continuously verified, and security controls enforced dynamically. Zero trust is built on several foundational pillars, each addressing a critical aspect of cybersecurity. These pillars work together to create a holsitic, adaptive security posture that continuously verifies trust and enforces least privilege across the organization, as shown below:

Deloitte's Zero Trust Framework



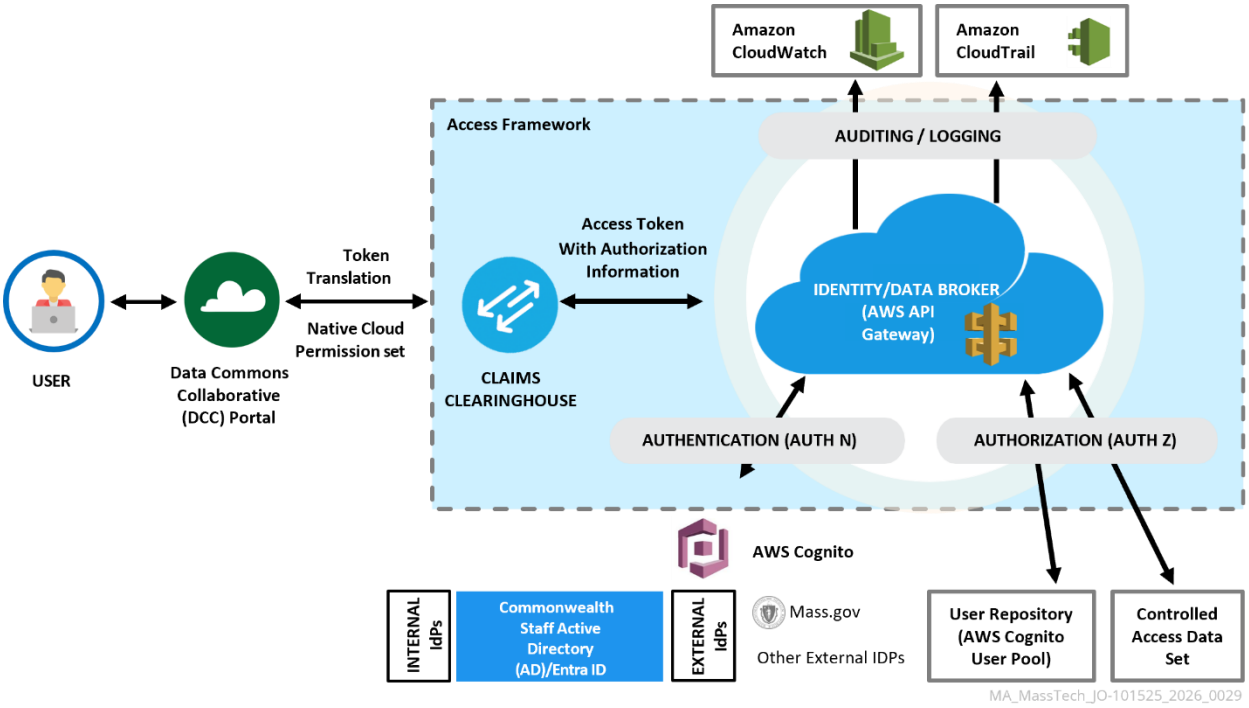
Deloitte's approach to Security, Governance, and Compliance is rooted in leveraging Zero Trust principles to help deliver secure and ethical solutions for DCC, and follows the process and principles outlined in the aiRMF described in section 2.3. Our solution approach is as follows:

Identity and Access Management

Role Based Access

Our DCC portal for MassTech provides secure and modernized role-based access, underpinned by our innovative access framework. Our access framework offers advanced capability in establishing role-based access controls and implementing federated identity management, to enable secure and compliant management of user roles and data permissions. The below graphic outlines how we use the access framework to enable Role Based Access for DCC solution.

Role Based Access for DCC



The access framework helps enforce RBAC policies based on role and affiliation information for users. Specific permissions tied to roles govern access levels for different dataset classifications, including Public (accessible to all), Restricted (requiring a request and approval), and Internal (limited to designated agencies or groups). Only users who have been duly authorized and assigned the appropriate role may view or download restricted datasets, maintaining a strong separation between data intended for public consumption and more sensitive information. The access control mechanisms are designed to be auditable, supporting compliance with policy and regulatory requirements by allowing straightforward review of user roles, permissions, and activity across the platform.

The authorization information and permissions for a user's access to specific controlled access datasets is managed by access framework using digital tokens which encode permissions at a granular level, such as row-level and column-level attributes within the datasets. The end-to-end system is orchestrated through AWS API Gateway, providing real-time token validation on each data access request. A key differentiator of our solution is our Clearinghouse module, which sits between the Identity Provider (IDP) and the protected data ecosystem. When a user attempts access, the Clearinghouse vets the access token received from Amazon Cognito or another IDP, confirming both the individual's status as a researcher/other authorized user and their specific dataset access rights. This access token is then translated into a machine-readable format containing entitlements and authorizations, ensuring other applications in the data ecosystem can readily interpret a user's permissions. The

clearinghouse's validation endpoint enables downstream data ecosystem application to verify tokens before granting dataset access. This design allows for fine-grained, consent-aware authorization, so only the right users can access sensitive or restricted datasets, and only with the correct approvals in place. By leveraging best practices in system design, FAIR principles and secure development, The access framework allows only authorized users to access sensitive datasets or system capabilities, reducing risk and supporting organizational policy.

Multifactor Authentication (MFA) and Single Sign On (SSO)

Data Commons Collaborative portal requires a secure and seamless way for users to access the portal along with their authorized datasets. Deloitte's approach to enabling access for the DCC portal supports single sign-on (SSO), allowing users to access the portal and its resources with secure set of credentials. At its core is AWS Cognito, which not only manages user registration, login, and multifactor authentication but also seamlessly integrates with external IDPs using standardized protocols (OIDC and OAuth), which enables flexibility and industry-leading security throughout the identity and access management lifecycle.

We recommend integrating DCC portal with Mass.gov for external users and MassTech Active Directory/Entra ID for employee users/administrators. This means Massachusetts users can access the DCC platform using their existing credentials through SSO, simplifying access without sacrificing security. The State's existing Mass.gov identity platformprovides modern identity capabilities to state's applications. This platform has been designed with the vision to establish a single identity for Massachusetts residents to provide digital government services in a secure and intuitive manner. The proposed approach is in alignment with State's overall vision of establishing a single Statewide, enterprise identity platform and helps to fully realize State's existing investments. Should MassTech wish to keep the AI hub decoupled from the Mass.gov authentication, we are flexible to work with MassTech to implement an authentication platform as part of the proposed solution.

For enhanced protection, especially when accessing sensitive datasets, we enable MFA, adding an extra layer of security to verify user identity and prevent unauthorized access. Under the Zero Trust framework, MFA is a cornerstone of the "never trust, always verify" paradigm. MFA allows every access request—no matter the user's location, device, or network—to be rigorously authenticated. With this model, trust is not granted based on perimeter or prior authentication; instead, every interaction requires real-time verification.

User Administration and Access Approvals

Our DCC solution features a custom-developed Admin Dashboard at the core of user access management, designed for both centralized administration and delegated governance at the domain level. While the dashboard acts as the primary interface for administrators overseeing role assignments, user entitlements, and access controls across the data ecosystem, it also empowers delegated roles—such as dataset stewards, institutional leads, and project owners—to review, approve, or enrich submissions related to their specific datasets, projects, or organizational domains. Within this dashboard, delegated roles are granted specialized permissions that let them directly manage access requests, review user credentials, and assess project relevance for data submissions pertinent to their purview. For example, a dataset steward can review requests to access their data assets, approve or deny based on institutional policies, and even add metadata or enrichment details to enhance submissions. This confirms each decision point is handled by those with the most context and domain experience, fostering accountability and precision in data governance. Through seamless integration with AWS Cognito, all user updates and permission changes are propagated across the environment, maintaining a secure, consistent access model.

A critical capability of the Admin Dashboard is its streamlined access request and approval workflow. When a user requests access to sensitive datasets or additional system capabilities, the request is automatically routed to designated administrators within the dashboard. Administrators can review detailed requester information,

including research credentials and prior access history, before approving or rejecting requests. This process incorporates verification insights from the Clearinghouse module, which validates user entitlements and dataset entitlements as part of the decision flow. All actions within the dashboard are logged for auditability, supporting compliance requirements and providing full transparency into access decisions.

By combining automation, fine-grained control, and real-time integration with AWS services, the Admin Dashboard enables MassTech administrators to proactively manage user access, respond to evolving business demands, and uphold stringent security and data governance standards. The modular nature of the our access framwork also means we fully support integrating with a commercial off-the-shelf (COTS) identity governance and administration (IGA) solution for user lifecycle management and delegated administration. With this end-to-end approach, MassTech benefits from a scalable, compliant, and user-friendly platform that prioritizes secure, role-based access for every interaction within the data ecosystem.

Commericial Off The Shelf (COTS) IAM Solution Integration

We understand that MassTech has not specified a particular approach for managing identity and access for the DCC portal and has asked vendors to recommend their best approach. Our proposed solution as illustrated earlier, uses our access framework to set up role-based access for the DCC portal. The access framework is built with microservices architecture and supports integration with leading COTS identity solution providers, such as those from Amazon/AWS, Microsoft Entra, Ping, Okta, and SailPoint through standard integration patterns. As part of our proposal, we use AWS cloud-native tools, Amazon Cognito and AWS API Gateway, in conjunction with our custom framework components like Clearinghouse. These tools help manage user identities and allow integration with the Mass.gov Identity Provider, letting users sign in using their existing Mass.gov accounts. Our approach provides significant advantage to the state from a cost management and integration standpoint – particularly since many DCC users will likely already have Mass.gov logins established. If MassTech decides to use a different identity and access management solution, we work together to select the best option to address your needs.

Deloitte brings over 25 years of experience designing and building Identity and Access Management (IAM) solutions for government agencies at both the state and federal levels. We have deep experience implementing various IAM solutions, strong alliance relationships with vendors, and successful track record along with industry recognition of being the leading IAM services provider year on year. We are excited to work with MassTech to understand its vision for managing identities across the organization and to tailor our approach for managing identities and user access as needed.

Dataset Tiering

Dataset tiering determines and protects data according to its sensitivity and business value. Deloitte's approach includes dataset categorization according to specific permissions and restrictions for data access based on defined sensitivity and regulatory requirements. Access policies are tailored to each data tier, confirming only authorized users can access pre-defined information outputs. Data access is also tracked and analyzed for suspicious activity, with automated alerts for policy violations or unusual access patterns.

Deloitte's zero trust strategy incorporates rigorous controls for logging, encryption, and audit trails for comprehensive visibility, data protection, and accountability across the organization's digital environment.

Logging

Deloitte's approach to logging employs continuous activity monitoring and logging user, device, network, and application activities in real time. Our solution is built for security, operational transparency, and compliance with evolving retention and integration needs.

- **Data Logging:** Event data, such as data access, downloads, synthetic generation, access requests, API calls, changes to metadata, will be systematically logged with corresponding contextual information (e.g., user identity, device health, location, timestamp, and purpose tags). This logging strategy supports security, transparency, and auditability and will be leveraged to support advanced analytics and risk scoring for activities.
- **Centralized Log Management:** Logs are aggregated and managed within secure, tamper-resistant systems, allowing for holistic visibility. We leverage tools like AWS CloudWatch and AWS CloudTrail to generate log data, which is then stored in encrypted data sources (e.g., Amazon S3 buckets) for durability and secure access. This infrastructure enables the ability to monitor, correlate, and analyze logs to provide unified visibility and faster incident discovery.
- **Integration With Monitoring Tools:** Our architecture supports seamless integration with Security Information and Event Management (SIEM) solutions as needed. Additionally, the solution is designed to interoperate with a range of leading logging and monitoring platforms—including Splunk, ELK (Elasticsearch, Logstash, Kibana), CloudWatch, OpenTelemetry, and DataDog—providing flexible options for real-time analysis, visualization, and incident response. This flexibility allows MassTech stakeholders to leverage existing capabilities or expand monitoring based on evolving requirements.
- **Automated Alerting and Response:** The monitoring stack can be configured to detect anomalies (such as unauthorized access, privilege escalation, or unusual data transfers) and suspicious behaviors. Automated alerts trigger incident response workflows, supporting rapid investigation and mitigation efforts.
- **Long-Term Log Retention:** The solution includes the ability to securely retain logs for three years or longer, supporting audit, compliance, and forensic investigation needs. Extended log storage duration beyond three years can be discussed and collaboratively defined with MassTech to best meet regulatory and operational requirements.

Audit Trails

Access attempts, changes to permissions, and security events are recorded in detailed audit trails. The audit trails detail vital access data, such as who attempted access, what was accessed, whether the attempt succeeded, what authortization was used, what was changed, and when the attempted occurred. Audit records are protected against tampering to support their integrity and forensic investigations, and the audit trails are maintained in accordance with relevant laws and standards (e.g., HIPAA, NIST), supporting audits and reporting. Regular, automated reports are generated to provide stakeholders with insights into security posture, compliance status, and incident history.

Embedding logging, encryption, and audit trails into Deloitte's zero trust framework enables:

- **Visibility:** Security teams have real-time, actionable insights into all activities.
- **Protection**: Sensitive data is safeguarded against unauthorized access and breaches.
- **Accountability**: Detailed, tamper-proof records enable rapid investigation, compliance, and continuous improvement.

This approach strengthens security, supports regulatory requirements, and builds trust with stakeholders.

Encryption

A zero-trust approach to data encryption requires that data is encrypted both at rest and in transit, providing confidentiality and integrity. Our solution approach encompasses automated key management that requires encryption keys are securely generated, stored, rotated, and retired using industry best practices. Different data types and tiers (e.g., confidential, restricted) receive tailored encryption controls based on sensitivity and regulatory requirements. Encryption can also be enforced at multiple layers—network, application, and data storage—to prevent unauthorized access.

With over 35 years of success in government security, our cyber specialists are dedicated to delivering a secure and scalable DCC solution. By tapping into our extensive cloud security experience, we deploy industry-leading encryption across every layer to protect your sensitive data at rest and in transit.

For data at rest, we leverage native AWS services—encrypting relational databases with built-in mechanisms including AWS KMS-backed encryption, and securing files with FIPS 140-2 validated, 256-bit AES encryption. S3 buckets are protected using AWS S3 Server-Side Encryption (SSE-S3 or SSE-KMS), streamlining compliance and regulatory alignment with effortless, managed key handling. Our solution uses Snowflake which is a cloud-based database configured with Continuous Data Protection (CDP) that includes a comprehensive set of features that help protect data stored in the platform against human error, malicious acts, and software or hardware failure. At every stage within the data life cycle, Snowflake enables the data to be accessible and recoverable in the event of accidental or intentional modification, removal, or corruption. The database software supports Time Travel, whereby data can be restored to points in time in the past, along with other configurable failsafe options.

For data in transit, our architecture utilizes stringent encryption protocols such as HTTPS (TLS 1.2+), SFTP (SSHv2), IPSEC VPN, and secure HL7 interfaces. Whether data moves for user access, integration, or system operations, strong encryption is in place across all channels.

Our solution integrates AWS Key Management Service (KMS) to provide centralized management of encryption keys across the MassTech data ecosystem. AWS KMS securely generates, stores, and controls cryptographic keys used for encrypting sensitive data—whether at rest or in transit. By leveraging KMS, the platform enforces fine-grained access policies, automates key rotation, and logs cryptographic operations for auditability. This approach simplifies compliance with security standards while protecting critical information, ensuring only authorized users and services can access or decrypt protected resources within the environment.

By blending proven security frameworks, AWS-native controls, and multiple layers of encryption, we deliver total confidence—empowering your organization while your DCC data remains protected, wherever it resides or travels.

Data Sanitization

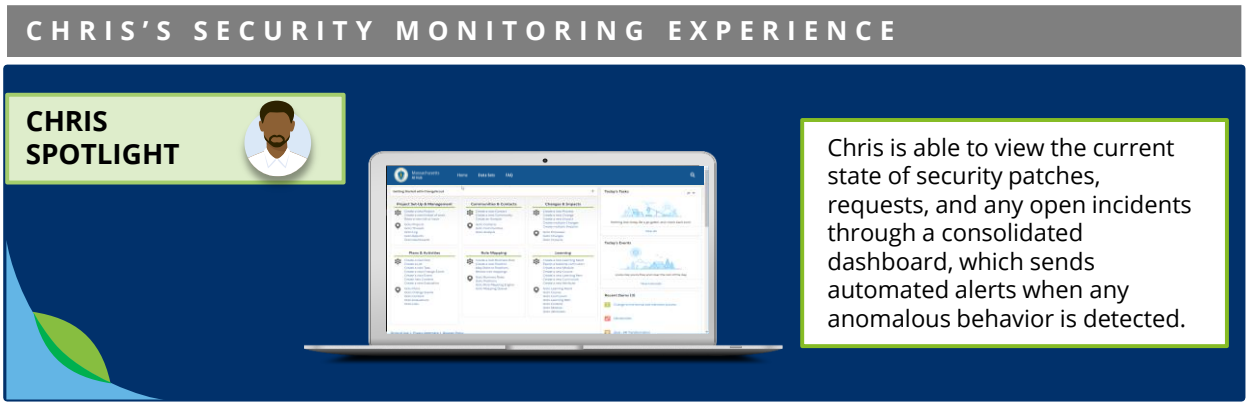
The DCC solution uses AWS API Gateway to enable API platform and provide users with API based access to data. It provides a powerful means to enforce input validation and request sanitization at the edge of your API platform, reducing exposure to malformed or unsafe data before it reaches backend services. Using API Gateway's request validators, we match incoming parameters, headers, and body payloads with predefined schema requirements (such as JSON Schema for REST APIs). This can include enforcing data types, mandatory fields, and allowable value ranges, thus rejecting requests that don't conform. Additionally, by defining mapping templates in API Gateway's integration settings, we transform and sanitize input: these templates allow for removal of unwanted characters, normalization of formats, or even filtering out potentially malicious content. This front-line validation and sanitization promote more secure, reliable, and predictable interactions with downstream microservices, offloading some data integrity checks away from application logic and reducing risk. Leveraging these features results in an API gateway that acts as both a gatekeeper and a filter, supporting compliance, security, and operational excellence.

Risk Management

Deloitte's risk management approach proactively identifies, assesses, and remediates risks across the data platform. Our methodology embeds security controls from initial design and through ongoing operations, combining automated detection with comprehensive security reviews by experienced analysts and includes the following components:

- **Vulnerability & Patch Management:** Proactive vulnerability management minimizes security risks by combining automated detection and timely remediation with operational governance.
  - **Vulnerability Scanning**: Infrastructure and applications are routinely scanned using automated tools, such as Qualys, to quickly identify weaknesses, which are triaged and tracked for prompt remediation.
  - **Automated Patching:** Systematic deployment of security patches can be managed centrally, through tools like AWS Systems Manager Patch Manager, integrated with change control, and scheduled to minimize business disruption.
- **Development Security Operations (DevSecOps) and Security Testing:** Embedding security practices, automation, and continuous monitoring across every phase of the development and deployment lifecycle to proactively address risks.
  - **DevSecOps Integration**: Security controls and automated checks are integrated directly into CI/CD pipelines, quickly detecting and mitigating vulnerability vulnerabilities, without slowing delivery.
  - **Automated Security Policy Enforcement**: Policy-as-code and real-time compliance checks enforce security and regulatory standards automatically throughout build, test, and deployment.
  - **Penetration Testing**: Scenario-based assessments are conducted, with findings documented, prioritized, and resolved through coordinated remediation efforts. Exact frequency and tools leverage can be decided in collaboration with MassTech.
  - **Static Application Security Testing (SAST):** Source code is scanned prior to deployment to detect and remediate vulnerabilities early in development, using tools such as Fortify or Veracode.
  - **Dynamic Application Security Testing (DAST):** Running applications undergo dynamic testing to identify and address security flaws prior to and after release.
  - **Incident Response:** Integrated incident response capabilities enable rapid detection, investigation, and recovery from security events, supporting resilience and compliance.
  - **Automated Alerting & Triage:** Automated alerts are generated from log data and monitoring tools (e.g., SIEM tools) and initiate predefined response workflows drive immediate escalation, analysis, and threat containment.
  - **Disaster Recovery:** We will work collaboratively with MassTech to design and build a disaster recovery plan that allows for the desired availability needed for this solution. We will facilitate a working session to talk through our current state architecture, and best practices around redundancy mechanisms, automated backups, geographically distributed recovery environments, etc. These components can be documented into a disaster recovery plan that is tested to validate recovery time objectives (RTO) and recovery point objectives (RPO), promoting continuity of operation in the event of a major disruption.
  - **Coordinated Response:** Security teams execute incident handling, communication, and recovery procedures, and engage the right stakeholders to rapidly restore services.
  - **Incident Response Plan:** We develop and maintain a formal incident response plan, aligning with industry leading practices. This plan can serve as the foundation for how incidents are handled and communicated so key stakeholders are informed and able to support remediation actions.
  - **Automated Alerting and Triage:** Suspicious activity triggers automated alerts and predefined response playbooks, enabling fast triage and escalation to specialized MassTech security teams and other key stakeholder such as reporting to MassTech within 24hours following a confirmed or suspected data breach.

The automated alerting and triage is particularly important for Chris, the AI Hub personnel we've been following along with:


CHRIS'S SECURITY MONITORING EXPERIENCE
CHRIS
SPOTLIGHT
Chris is able to view the current state of security patches, requests, and any open incidents through a consolidated dashboard, which sends automated alerts when any anomalous behavior is detected.

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Collaborating on Terms of Use

Deloitte will work closely with the Massachusetts Technology Collaborative (MassTech) and the AI Hub team to define clear, transparent, and user-centric Terms of Use that align with the Hub's mission and legal requirements. Our approach includes facilitating working sessions to incorporate MassTech's governance framework, compliance obligations, and stakeholder priorities. We will work collaboratively to capture key principles—such as data privacy, intellectual property rights, acceptable use, and ethical AI guidelines—and translate them into actionable terms. Once drafted, Deloitte will engage MassTech's key stakeholders such as legal and communications teams to refine the language, ensure alignment with state policies, and prepare the Terms of Use for publication. Finally, we will support the integration of these terms into the AI Hub's digital platform so they are easily accessible, user-friendly, and regularly updated as the Hub evolves.

Ethical Data Handling

Deloitte is committed to upholding the highest standards of ethical data handling in all client software solutions. We adhere to rigorous ethical standards in managing client data, promoting transparency, security, and compliance through the data lifecycle. We only collect the minimum necessary data, and use it for agreed upon purposes. Any additional uses of the data would first be discussed and documented as new use cases and agreed upon before additional use. Our solutions incorporate strong security controls, comly with applicable regulations (e.g. GDPR, HIPAA, CCPA) and undergo regular audits to maintain accountability and trust. In addition, we prioritize clear communication with clients regarding data practices and embed privacy-by-design- principles into our solutions to support responsible innofation and long-term data stewardship. Our principles of transparency, data minimization, purpose limitation, security and confidentiality, and compliance and accountability create the foundation for our approach to ethical data handling.

Enforcement Mechanisms

Deloitte's ethical data handling principles are embedded in every stage of client software solution development and operation. Enforcement is achieved through a combination of policy, technical controls, training, and continuous monitoring—confirming that client data is managed responsibly, securely, and transparently.

Deloitte's data governance policies define roles, responsibilities, and procedures for ethical data handling. These include access controls, encryption, and automated monitoring embedded in software architectures, tracking and logging of data usage for auditability, audit trails, and regular internal and external audits verify compliance with ethical principles and regulatory obligations.

2.7 Testing, Rollout and Adoption

Deloitte's approach to testing and rollout for the Data Commons Collaborative centers on Acceptance Test-Driven Development (ATDD) to validate user stories early and often, embedding rigorous, reusable test cases throughout the development lifecycle to confirm quality, reliability, and rapid, secure deployments. Our team leverages proven experience in collaborative data platforms and AI ecosystems, working closely with developers to assess code, triage issues, and manage smooth rollouts that build user confidence and accelerate adoption.

Deloitte in Action

Proven Data Quality Assurance Expertise: North American Rail Client

For a major North American rail client, Deloitte implemented rigorous data quality assurance by applying over 300 automated quality rules across 3,000+ data assets within Informatica's IDMC platform. Leveraging AI-powered tools for metadata discovery and automated data lineage, our approach reduced manual testing effort and accelerated validation cycles. This comprehensive QA process ensured consistent, trusted data for business users and supported the client's successful enterprise-wide data transformation.

To drive adoption and usability, we incorporate dedicated User Acceptance Testing (UAT) windows and targeted UAT groups—both within the organization or through an external pilot group. This structured approach enables us to gather actionable feedback, refine features based on real user input, and align the platform with practical user needs before full public launch. Throughout the software lifecycle, we leverage Deloitte's proprietary accelerators to support test planning, execution, and stakeholder engagement. By combining Agile practices, ATDD, iterative feedback, and advanced testing capabilities, our approach enables a user-focused solution that meets the evolving needs of the Massachusetts AI Hub.

Quality Assurance and Testing

Quality and accessibility are key to maintaining a robust user population within the AI Hub. Deloitte leverages its extensive experience in supporting complex projects, such as the the IRS's Taxpayer Experience Platform (30m+ annual users) to deliver quality and reliability through comprehensive testing strategies. We do this by beginning testing activities early in the development lifecycle through a DevSecOps approach that supports flexibility and availability of test environments, increasing access to synthetic test data and virtualized services, embedding security scans into the code pipeline, automating test case generation to expand test coverage, and streamlining performance testing. AI-driven tools are employed to conduct rigorous testing, verifying that every component of the platform adheres to the highest standards. Our approach begins with the development of a Quality Assurance (QA) plan that encompasses all aspects of the platform, including functionality, performance, security, and compliance, including applicable accessibility standards:

- **Functional Testing:** Full end-to-end testing will be conducted to validate all aspects of the application from the front-end UI to the back-end services. With a strong focus on the user experience, we continuously conduct analysis against browser usage data to track consumer technology trends and validate the existing browser testing toolset (e.g., BrowserStack) meets current user trends. We execute front-end tests against a variety of desktop browsers (Chrome, Firefox, Edge, Safari), operating systems, and mobile devices (e.g., iOS, Android), as required, to validate a consistent user experience, regardless of the device being used.
- **Test Automation:** To increase efficiency and frequency of delivery, we emphasize the importance of test automation using tools like Selenium for UI automation and SoapUI for API automation. Our testing framework can be integrated within CI/CD pipelines (e.g. Jenkins, GitHub Actions), allowing for frequent and consistent validation of code quality.

- **Performance:** Performance testing will be streamlined through the integration of smoke and release-level load testing into the CI/CD pipeline, including recurring execution in the testing environments to identify performance limitations within the latest code build.
- **Section 508 Accessibility:** UI testing will validate that front-end development aligns to 508 compliance standards using Deloitte-built automated accessibility testing tool suite, promoting 508 standards and accelerating 508 defect identification and remediation.

The QA plan is structured to cover the entire lifecycle of the platform, from initial development through production deployment and ongoing maintenance. Our test approach includes detailed test planning, preparation, and execution phases, using tools like Jira, TestRail, or Zephyr for test case management and defect triage processes to validate functionality and integration.

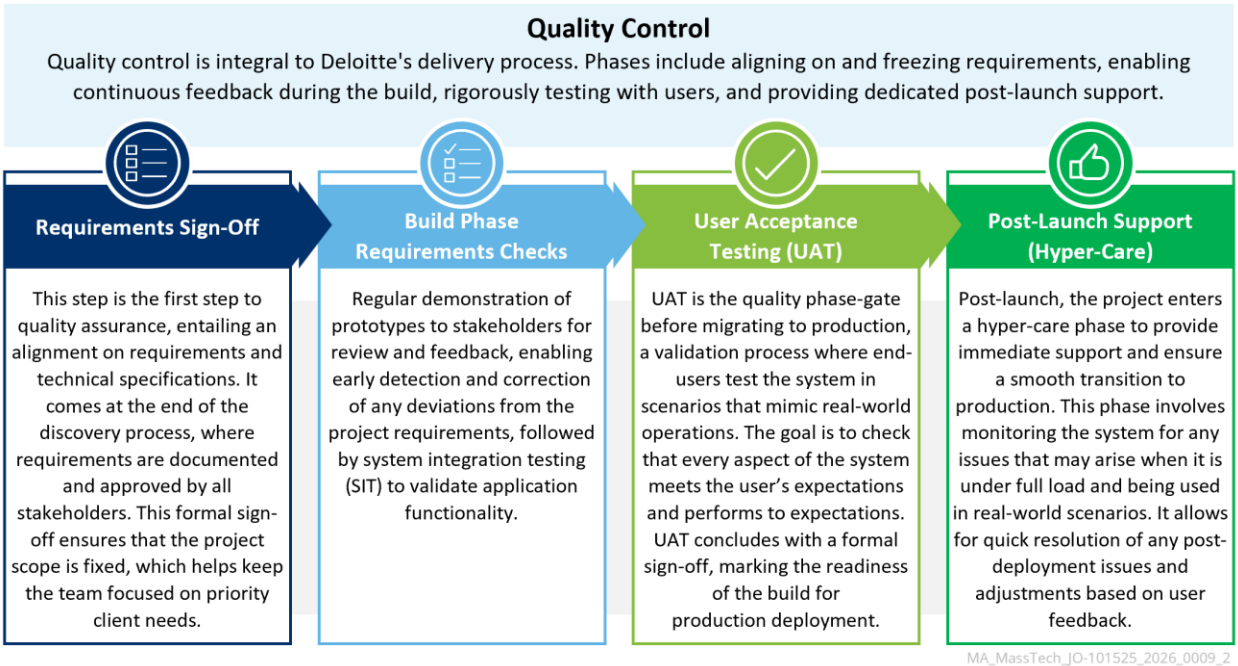
Deloitte in Action

Delivering Automation Excellence: IRS Taxpayer Services

Deloitte played a pivotal role in advancing the IRS's digital transformation by implementing a robust test automation framework for the Taxpayer Experience Portal. This framework supported the development and maintenance of authenticated digital portals serving over 40 million users annually, including individuals, businesses, and tax professionals. By automating over 70% of test cases, Deloitte significantly reduced manual testing efforts, accelerated release cycles, and ensured the reliability of critical applications. Our efforts contributed to the IRS receiving multiple Service to the Citizen Awards, recognizing excellence in public digital product delivery.

Deloitte's project managers will implement a comprehensive Quality Management Plan (QMP) that outlines the processes, roles, and tools necessary for delivering high-quality outcomes on time. The QMP addresses all categories of work within the project scope, including IT strategy, development, and operations support, regardless of project size or duration. As part of the Quality Control Plan, our approach includes the use of advanced AI-enabled tools to enhance delivery through improved test planning, execution, and stakeholder engagement. These tools support real-time tracking of testing progress, automate quality checks, and facilitate collaboration across teams, helping to identify and address gaps quickly.

Deloitte's Quality Control Process


Quality Control
Quality control is integral to Deloitte's delivery process. Phases include aligning on and freezing requirements, enabling continuous feedback during the build, rigorously testing with users, and providing dedicated post-launch support.
Requirements Sign-Off
This step is the first step to quality assurance, entailing an alignment on requirements and technical specifications. It comes at the end of the discovery process, where requirements are documented and approved by all stakeholders. This formal sign-off ensures that the project scope is fixed, which helps keep the team focused on priority client needs.
Build Phase Requirements Checks
Regular demonstration of prototypes to stakeholders for review and feedback, enabling early detection and correction of any deviations from the project requirements, followed by system integration testing (SIT) to validate application functionality.
User Acceptance Testing (UAT)
UAT is the quality phase-gate before migrating to production, a validation process where end-users test the system in scenarios that mimic real-world operations. The goal is to check that every aspect of the system meets the user's expectations and performs to expectations. UAT concludes with a formal sign-off, marking the readiness of the build for production deployment.
Post-Launch Support (Hyper-Care)
Post-launch, the project enters a hyper-care phase to provide immediate support and ensure a smooth transition to production. This phase involves monitoring the system for any issues that may arise when it is under full load and being used in real-world scenarios. It allows for quick resolution of any post-deployment issues and adjustments based on user feedback.
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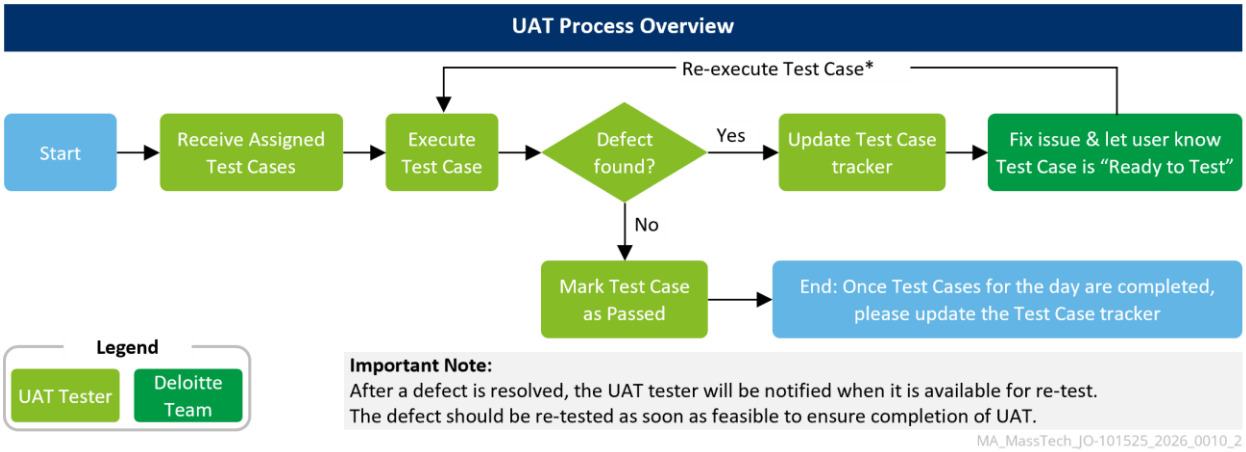
User Acceptance Testing (UAT) is crucial for confirming production readiness and validating that business requirements have been met. We will conduct a soft launch or MVP of the portal and its capabilities, collaborating with stakeholders to identify a dedicated UAT group within the organization and an external pilot group for initial

testing and feedback. Our UAT process, as outlined in the UAT Process Overview, is systematic and cyclical, involving testers who receive, execute, and evaluate test cases. Included as part of testing, the use of assistive technologies, such as screen readers and magnifiers, confirms that accessibility requirements are appropriately addressed. Communicated defects are relayed for resolution, supporting alignment to all applicable standards. This approach aligns all aspects of the system with user expectations and performance standards. UAT concludes with a formal sign-off, marking the readiness of the build for production deployment. By focusing on human-centric testing, DCC is designed to meet practical user needs, facilitating a smooth transition to full operational status.

Quinn and Chris each have different roles to play during UAT. User feedback on the external-facing portal is critical to make sure that the final portal is usable, useful, and effectively designed to enable data discovery and use. Quinn, who has been an engaged stakeholder from the start of the Data Commons journey, is invited to participate in the initial pilot for the user portal and Commons Credits system. As part of this pilot, she is given early access to the portal, and a small set of questions for her to repsond to, providing feedback on how effectively the portal is meeting her needs. Chris participates in a similar role, focused on the internal dashboards, workflows, and alert processes. Quinn and Chris are part of a larger stakeholder group, so they don't have to test each piece of the Data Commons solution – by engaging a wide variety of testers, each individual user only has to focus on a few key functionalities to make sure that the entire system works as intended, which reduces the burden for stakeholders participating in UAT.

UAT Process Overview


UAT Process Overview
Re-execute Test Case*
Start
Receive Assigned Test Cases
Execute Test Case
Defect found?
Yes
Update Test Case tracker
Fix issue & let user know Test Case is "Ready to Test"
No
Mark Test Case as Passed
End: Once Test Cases for the day are completed, please update the Test Case tracker
Legend
UAT Tester
Deloitte Team
Important Note:
After a defect is resolved, the UAT tester will be notified when it is available for re-test.
The defect should be re-tested as soon as feasible to ensure completion of UAT.

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Technology Adoption

Deloitte understands that the AI Hub users will have a variety technical fluency and understanding of the data sets available within the DCC. We will take a specialized approach, based on the personas created during the required phase, to align our technology adoption approach to these different groups and meet users where they are to help educate them on using the DCC.

As specialists in Human-Centered Change and AI transformation, Deloitte's approach prioritizes the development of tailored training and adoption strategies, leveraging trusted methodologies like the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) and delivering sessions through multiple modalities, including in-classroom, virtual, and VR/AR environments. Leveraging Deloitte's AI Academy, we create custom learning materials and programs for both end users and administrators, supporting broad upskilling and knowledge transfer. We recently delivered foundational and intermediate GenAI training for a financial services organization's global workforce, covering GenAI foundations, prompt engineering, and managing GenAI. We also developed learning journeys for over 700 leaders in an investment management organization to enhance AI fluency and stregnthen their team's ability to lead through AI transformation.

Deloitte in Action

Deloitte's Training and Support Experience for Data Modernization: Massachusetts Department of Public Health (DPH)

Deloitte delivered tailored training and launch support for the Massachusetts DPH's Data Modernization Initiative, integrating over 50 datasets from more than 10 source systems. By developing comprehensive training programs, user guides, and resources, Deloitte upskilled both end users and administrators, accelerating onboarding, improving data literacy, and enabling rapid adoption of new analytics capabilities—resulting in sustainable transformation and measurable impact.

We anticipate that end users will be the strongest evangelists for the AI Hub's value, and will identify opportunities for Data Commons users to share their research, highlighting how the AI Hub helped along the way, as Quinn shows below:

QUINN SPOTLIGHT

QUINN'S IMPACT WITH THE DATA COMMONS

Quinn has used the Data Commons to create new insights about the early detection of chronic illness in Massachusetts. She presents the insights at a local conference and uses the opportunity to highlight how the AI Hub contributed to her research. Additional start-ups in attendance are interested in Quinn's use of the AI Hub, and sign up to participate in the Data Commons as their primary source of data and compute.

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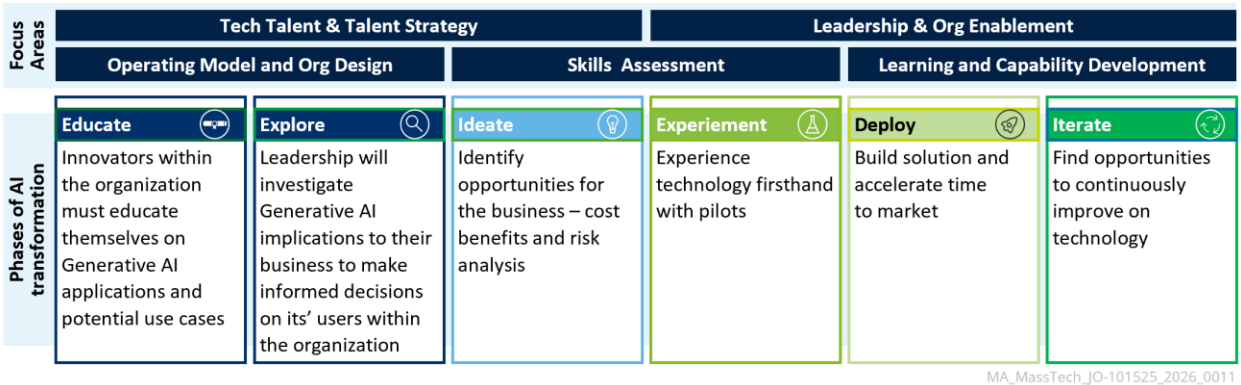
As illustrated below, our AI Transformation Methodology is designed to facilitate sustainable change and deliver measurable value for the AI Hub. We will collaborate with domain experts and early adopters to identify a group of super users who can serve as change agents to inform others of the potential applications and successes. Throughout the process, success is driven by strong stakeholder engagement, clear documentation, agile delivery, and continuous improvement, creating a foundation for lasting transformation and ongoing value realization.

Deloitte's AI Transformation Methodology


Focus Areas
Tech Talent & Talent Strategy
Leadership & Org Enablement
Operating Model and Org Design
Skills Assessment
Learning and Capability Development
Phases of AI transformation
Educate
Innovators within the organization must educate themselves on Generative AI applications and potential use cases
Explore
Leadership will investigate Generative AI implications to their business to make informed decisions on its' users within the organization
Ideate
Identify opportunities for the business – cost benefits and risk analysis
Experiement
Experience technology firsthand with pilots
Deploy
Build solution and accelerate time to market
Iterate
Find opportunities to continuously improve on technology

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Documentation and Launch Support

Deloitte's approach to documentation and launch support centers on empowering users and driving productive adoption of AI into existing work. We prepare comprehensive resources—including detailed user manuals, technical guides, API documentation, FAQs, troubleshooting guides, and quick reference cards—organized in an accessible, searchable repository to support users at every skill level. Our approach to executing successful launches includes:

- Creating an assessment of organizational readiness across priority stakeholder groups to document how each group will be benefited by DCC roll-out and what potential risk/readiness factors are
- Delivering stakeholder communications that prepare users for change and facilitates continuous engagement
- Conducting pulse checks with early adopters, pilot users, and priority stakeholder segments
- Reinforcing key messages with executive stakeholders via outreach from MassTech AI Hub leadership
- Defining, measuring, and reporting on adoption metrics

Our launch enablement resources provide direct access to the latest system information to team members, stakeholders, administrators, and potential end users. We establish a document repository leveraging project management software such as SharePoint, Jira, or Confluence to allow for version control and archival for future use. By pairing AI alongside our technical team, we achieve greater efficiency with our compliance process to align with existing organizational standards.

For launch, we define clear objectives, key activities, and success criteria, and develop a structured schedule with readiness checks and go-live milestones. During launch, real-time monitoring of platform performance and user activity through tools like Splunk and AppDynamics enables us to promptly capture feedback and address issues, with critical concerns escalated for immediate resolution. This hands-on, user-focused support helps people confidently integrate AI into their work, making the platform genuinely useful and productive from day one.

Quinn and Chris were able to achieve their goals by using the Data Commons, as shown below.

DATA COMMONS COLLABORATIVE SUCCESS

Quinn leveraged the Data Commons to search, explore, and identify data; conduct research and analysis; share data; and assess AI and data-driven sources of bias, all without any extra cost. Her efforts to upload, share, and define datasets have improved the overall AI Hub and earned her Commons Credits. Her resulting research is being used as a critical input for the Commonwealth of Massachusetts in deciding where to deploy early detection programs– which may result in more healthy Massachusetts residents.

Chris is able to manage the ingest, security, and fairness of the data housed within the Data Commons, making sure that research like Quinn's is robust and safe. The data is trustworthy enough to make a real difference to Massachusetts's policy makers, start-ups, and academic communities.

MA_MassTech_JO-101525_2026_0039

2.8 Deliverables

Deliverable	Our Approach to Delivery	Sample Outputs
Detailed Project Plan and Timeline	We work with AI Hub to identify format and expectations for level of detail of the project plan and timeline. We extensively document all sprint plans, epics, and user stories in a tool like Jira. We establish a regular reporting cadence with AI Hub leadership to share and discuss updates to our project implementation activities and timeline milestones, as captured in the project plan.	• Full schedule of phases, sprints, milestones- • Documented Jira epics, user stories, and dependencies • Regular reporting structure and update logs
Detailed Platform Architecture Documentation	Within the first month after project kickoff, we develop and share a draft Platform Architecture document, including detailed conceptual and logical architecture diagrams, system flow diagrams, and high-level service design schemas. We iterate on this document with AI Hub leadership as implementation proceeds.	• Architecture diagrams (conceptual, logical, system flow) • Service design schemas and platform components • Iterative updates and annotated revisions
Initial Data Catalog and Metadata System	Deloitte and Snowflake work with key AI Hub DCC stakeholders to identify foundational requirements and expectations for the data catalog and metadata framework which we document in a data catalog and metadata system design. This design will be implemented across the DCC portal and the Snowflake data platform.	• Data catalog and metadata framework design • Stakeholder requirements and implementation guides • Integration blueprint for DCC and Snowflake
Fairness and Bias Reporting Dashboard	We design and implement an interactive dashboard that provides transparent, actionable insights into fairness and bias across datasets and AI models within the Data Commons. Leveraging automated analytics and visualization tools, the dashboard will enable stakeholders to monitor key metrics, track mitigation efforts, and review audit trails. It will support drill-down capabilities for detailed analysis and facilitate ongoing compliance with ethical standards, empowering users to proactively address bias and promote equitable outcomes.	• Interactive visualizations of bias and fairness metrics • Audit trails and tracking of mitigation efforts • Drill-down capability and compliance reporting
Security and Governance Implementation	Our approach to security and governance centers on scalable controls integrated with Snowflake as the data platform provider. We deploy role-based access management, single sign-on, and multi-factor authentication to safeguard sensitive data. Governance frameworks will include policy management, approval workflows for restricted datasets, and comprehensive audit logging. These measures validate data integrity, regulatory compliance, and transparent oversight, supporting both operational efficiency and stakeholder trust.	• Role-based access management and multifactor authentication • Policy management and approval workflows • Comprehensive audit logs and compliance reporting
Training and Launch Materials	We develop comprehensive training and launch materials tailored to diverse user groups, including researchers, curators, and administrators. These resources will include step-by-step guides, video tutorials, FAQs, and live support sessions, all designed to facilitate rapid onboarding and effective platform adoption. Training will emphasize responsible data sharing, use of Commons Credits, and best practices for security, fairness, and bias mitigation.	• Step-by-step guides and video tutorials • FAQs and live support materials • Responsible use, security, and bias mitigation training content
Sample Commons Credits ledger output	We provide a sample output from the Commons Credits ledger, illustrating transparent tracking of credit issuance, transfer, and redemption. The output will demonstrate compatibility with existing identity management systems and support auditability and historical analysis. It will showcase how credits are earned, spent, and managed, reinforcing the integrity and transparency of the incentive system.	• Sample records of credit issuance, transfer, and redemption • Integration with identity management systems • Audit and transparency features for credits
Explanation of planned industry engagement	Deloitte's strategy for industry engagement involves fostering partnerships with leading organizations, academic institutions, and technology providers. We facilitate collaborative workshops, advisory panels, and pilot programs to confirm the Data Commons	• Strategy for partnership formation and engagement • Workshop and advisory panel planning

Deliverable	Our Approach to Delivery	Sample Outputs
	reflects real-world needs and drives innovation. Engagement efforts will focus on expanding data resources, co-developing use cases, and enabling cross-sector knowledge sharing to position Massachusetts as a hub for ethical AI advancement.	• Use case development and cross-sector knowledge sharing
Pilot user feedback	To validate the platform meets user expectations and delivers tangible value, we conduct a structured pilot program with representative stakeholders. We collect qualitative and quantitative feedback through surveys, interviews, and usage analytics. Insights from pilot users will inform iterative improvements to platform functionality, user experience, and governance, enabling the Data Commons to evolve in alignment with community needs and industry standards.	• Structured feedback from representative pilot users • Summaries of survey, interview, and analytics findings • Actionable recommendations for platform improvements

3.0 Team Structure & Key Personnel

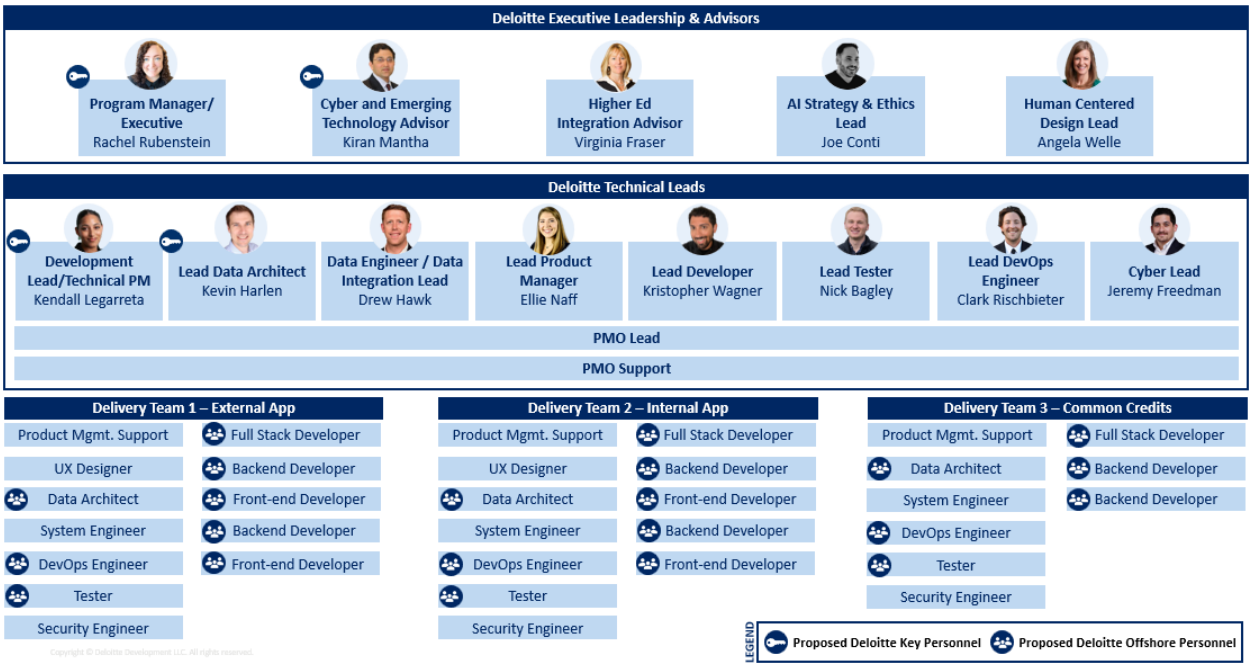
3.0 Team Structure and Key Personnel

Deloitte has a proven track record in designing, implementing, and operating enterprise-scale AI and data platforms, combined with deep experience in public sector transformation, bringing the right blend of skills, perspectives, and leadership to every phase of this engagement. We will bring professionals with diversified experience across the requested services, allowing us to anticipate challenges, drive innovation, and deliver solutions that are robust, flexible, and tailored to the unique needs for the DCC ecosystem serving diverse stakeholders.

Deloitte's approach is grounded in building for flexibility, security, and future-proof scalability. By combining technical excellence with strategic program management, Deloitte delivers a comprehensive staffing solution that accelerates value, reduces risk, and positions the DCC for long-term success in driving AI innovation.

The proposed teams and key personnel roles for the project are organized using the following proposed structure as one integrated team. For an initiative of this size, scope, and complexity, we propose configuring the DCC delivery team as agile, cross-functional scrum teams focused on key aspects of DCC scope. This enables teams to work independently on separately prioritized backlogs of work, while maintaining tight coordination on critical integration touchpoints (e.g., integrating Commons Credits functionality into the front-end user experience). This model also provides flexibility to the DCC team to scale up or scale down as needed where additional agile delivery team capacity can be added alongside the existing team structure without causing disruption to ongoing work. We staff a mix of onshore, US-based Deloitte leaders and specialists alongside a deeply experience team of offshore, India-based Deloitte professionals.

Deloitte's Proposed Team Structure



Our hybrid onshore/offshore teams have a strong history of successfully delivering complex projects across industries, including current delivery within the Commonwealth of Massachusetts. The offshore team works seamlessly with US local site teams, using the same processes, methodologies, and tools to maintain consistency and quality across all engagement deliverables. This integrated approach enables us to meet tight deadlines,

operate more cost-consciously, and maintain the highest standards of quality. We have rigid processes in place that do not allow offshore resources to production environments/production data. The key functions of governance, security, and compliance will all be handled by onshore US-based personnel.

Offshore professionals are not subcontractors; they are full employees of Deloitte US. These professionals receive the same rigorous training as their US counterparts and are subject to identical compliance requirements in ethics, independence, data privacy, business continuity, disaster recovery, and information security. Our talent pool in India is highly skilled, with deep experience across technology, functional, and industry domains. For example, our global delivery centers in India are staffed by more than 45,600 dedicated consultants, with 60% having more than four years of experience and exposure to multiple project lifecycles. This allows our teams to be adaptable, highly experienced, and able to support both onsite client-facing and offshore delivery roles.

To successfully deliver the requirements for this project, we have outlined our proposed roles and responsibilities in the table below, followed by resumes of our team members that would bring their experience to deliver this project.

	Proposed Role	Description	Years of Experience
1	**Program Manager / Executive**	The Program Manager is responsible for leading, organizing, and overseeing all aspects of the DCC project to successfully deliver agreed upon outcomes. This role involves closely collaborating with the AI Hub executive leadership team to drive the vision and execution through the vendor team. This includes orchestrating the entire delivery team, technical delivery, governance, and project timelines to deliver on time and budget. The Program Manager serves as the central point of contact for project teams and stakeholders, facilitating collaboration, tracking progress, managing risks, and driving accountability to achieve the strategic objectives of the DCC initiative.	15+
2	**Cyber and Emerging Technology Advisor**	The Cyber and Emerging Technology Advisor will define and support implementation of security, governance, and compliance frameworks for the DCC, ensuring robust protections such as encryption, logging, audit trails, and continuous monitoring to safeguard data integrity and privacy. This role will drive ethical data handling practices, conduct regular security audits and compliance reviews, and provide strategic guidance on integrating emerging technologies. Acting as both a trusted advisor and thought leader, the Advisor will help stakeholders anticipate and navigate evolving cyber risks while embedding responsible innovation and security-by-design principles across the ecosystem.	25+
3	**Higher Ed Integration Advisor**	The Higher Ed Integration Advisor will serve as a liaison between the Massachusetts AI Hub, MassTech, the consulting team, and higher education institutions – including universities, colleges, and research centers, ensuring alignment across strategy, delivery, and stakeholder priorities while fully integrating academic perspectives into the DCC. The Higher Ed Integration Advisor will help guide collaboration with academic leaders and researchers, translating the program's technical and governance deliverables into meaningful value for the higher education community and the broader stakeholder ecosystem. This role will also support executive communications and provide strategic direction to foster adoption and long-term sustainability of the platform across academic and non-academic partners alike.	20+
4	**AI Strategy & Ethics Lead**	The AI Strategy & Ethics Lead will be responsible for guiding the strategic direction and ethical framework of the DCC. This role involves developing and implementing AI fairness capabilities, including bias detection, auditing, and mitigation tools. The leader will promote ethical standards and equitable access for AI development within the DCC. They will also document bias impact and create dashboards to monitor and report on AI fairness. Additionally, this role will involve engaging with stakeholders to align the AI strategy with the overarching goals of the Massachusetts AI Hub.	15+
5	**Human Centered Design Lead**	The Human-Centered Design Lead will focus on confirming that the Data Commons Collaborative platform is user-friendly and meets the needs of researchers, government, startups, and industry users. This role involves conducting user research, developing user personas, and creating user journey maps to inform the design process. The lead will collaborate with technical teams to integrate user feedback into the platform design and make the interface intuitive and accessible. They will also prepare training and support materials to facilitate user adoption and engagement with the platform.	10+

	Proposed Role	Description	Years of Experience
6	**Development Lead / Technical Project Manager**	The Development Lead / Technical Project Manager will spearhead the coding and development of the Massachusetts AI Hub's Data Commons Collaborative platform. This role involves leading the technical architecture design and actively developing the platform's backend infrastructure, including integrating metadata management systems, synthetic data generation tools, and AI fairness frameworks. Responsibilities include writing and reviewing code, implementing role-based access and identity management systems, and developing APIs for data access and analytics.	5+
7	**Lead Data Architect**	The Lead Data Architect will design and build the technical architecture for the Data Commons Collaborative, including the website and backend infrastructure. This role includes implementing metadata management, cataloging, and discovery tools, as well as developing a role-based access and identity management system. The Data Architect will also be responsible for creating a central ledger for tracking "Commons Credits" and enabling API-based data access and usage analytics. Validate metadata completeness and adherence to FAIR data principles will be key responsibilities, along with supporting ingestion pipelines and version control.	8+
8	**Data Engineer / Data Integration Lead**	The Data Engineer / Data Integration Lead will design and implement pipelines to ingest, standardize, and prepare datasets for the DCC. Working closely with the Data Architect, this role oversees metadata enrichment, schema alignment, and FAIR compliance while enabling API-driven access and interoperability. The position bridges technical build and stakeholder needs by integrating multi-agency data sources into a unified platform and supporting governance and access models.	5+

Proposed Roles.

Extensive Executive Program Management Leadership: Over 16 years of experience leading large-scale technical, data-focused programs across federal government and state agencies, including the IRS and HHS. Consistent track record of delivering highly complex projects within time, budget, and scope requirements.

Ask Me About…

- My favorite cloud data platform: Snowflake
- My experiences leading Federal Government clients through their data journeys
- Check out my LinkedIn with the QR code above!

Data Management & Responsible Innovation: Directed multidisciplinary teams to deliver data management, integration, and advanced analytics solutions that modernized federal environments and supported responsible AI-driven decision-making. Experienced in aligning with FAIR data principles, AI fairness, and ethical adoption frameworks.

Proven Delivery & Accountability: Delivered critical data, analytics, AI, and technology solutions to meet federal legislative mandates. Experienced in managing risks, and driving accountability across multi-year, multi-stakeholder programs. Consistently delivers results that achieve both immediate milestones and long-term strategic impact.

Executive Stakeholder Engagement & Strategic Communications: Highly skilled at engaging executive leaders, stakeholders, commercial organizations, and industry groups to build consensus and maintain trust across complex

environments. Experienced in fostering collaboration across government and industry in alignment with the AI Hub's mission.

Strategic Communication & Translation of Technical Concepts: Known for translating complex technical strategies into actionable roadmaps for executives and diverse stakeholders. Excels at facilitating communication, driving adoption, training users, and delivering technical solutions that meet the needs of both internal and external users.

EMPLOYMENT HISTORY

Deloitte

Principal *May 2009 – Present*

- Data and AI leader across all Deloitte State, Local, and Higher Education projects within the Commonwealth of Massachusetts.
- Program executive leading the Internal Revenue Service (IRS) data ingestion and processing modernization program which processed and made data available from 3+ billion forms annually.
- Senior leader overseeing the first GenAI solution deployment within the IRS technical environment which integrated multiple, disparate data sources to decrease processing time for amended returns.
- Integrated 200+ stakeholders to implement technology and data flow changes required by the Tax Cuts and Jobs Act, Taxpayer First Act, and CARES Act within federal agencies.
- Led the development and implementation of numerous algorithms to identify anomalies, including data identification, preparation, and cleansing to enable AI for low fidelity sources.
- Leader responsible for the integration of disparate data sets across the Department of Health and Human Services, NIH, CDC, and FDA into a unified platform to enable cross-departmental business outcomes.

EDUCATION AND CERTIFICATIONS

- Master of Business Administration | University of Maryland, Smith School of Business
- BA, International Affairs | The George Washington University
- ITIL Foundations v3

Kiran Mantha

Cyber and Emerging Technology Advisor

WHY KIRAN IS A GREAT FIT FOR MASSACHUSETTS

Extensive Cybersecurity & Technology Leadership: Over 25 years of experience leading state and federal transformation projects in IT strategy, cybersecurity, and data management. As the leader of Deloitte's Public Sector Cyber practice for state, local government, and higher education in the Northeast, Kiran is uniquely positioned to help the DCC embed security, compliance, and governance frameworks from the outset.

Proven Record in Secure Transformation: Successfully directed large-scale cybersecurity and modernization initiatives for clients such as the State of Connecticut and New York City, implementing practices including encryption, logging, audit trails, and continuous monitoring. Demonstrated ability to deliver resilient, secure platforms in complex and high-stakes environments.

Governance, Risk & Compliance Experience: Brings deep knowledge in governance, risk and compliance frameworks, establishing policies and controls that align with federal, state, and industry standards. Skilled at embedding ethical AI use, privacy protections, and responsible innovation into data platforms.

Ask Me About…

- Anything cyber and trustworthy AI related
- My favorite sport: cricket
- Check out my LinkedIn with the QR code above!

Resiliency & Threat Management Vision: Experienced in threat intelligence, crisis management, and incident response, enabling organizations to anticipate, prepare for, and mitigate evolving cyber risks. Provides the strategic direction for resiliency and continuous monitoring that reinforces the DCC remains a trusted, secure platform.

Emerging Technology & Responsible Innovation Advisor: Provides strategic guidance on integrating emerging technologies while balancing innovation with risk management. Known for embedding security-by-design principles in modernization projects to confirm new capabilities are both innovative and safe.

Stakeholder Engagement & Local Insight: Trusted advisor to government agencies, universities, and Fortune 500 companies, with a strong record of building consensus across diverse stakeholders. As Deloitte's lead for the MassTech consulting services portfolio, Kiran brings direct understanding of Massachusetts' priorities, ensuring the DCC aligns with the Commonwealth's vision for responsible innovation and economic development.

EMPLOYMENT HISTORY

Deloitte

Principal | Cybersecurity & Emerging Tech Leader *August 2000 – Present*

- Led the delivery of establishment of a state-wide enterprise digital identity platform for citizen users for State of Connecticut (ForgeRock based CT.gov platform).
- Responsible for overall security and risk management across largescale digital transformation efforts for all Deloitte technology projects for Vermont, Massachusetts, Connecticut, New Hampshire, and Maine.
- Oversaw largescale transformation for a major metropolitan city and their cyber command to provide systems integration services to carry out its mission to enhance vulnerability management, security event monitoring data integration, application security and endpoint and email protection programs and create a strategic alliance across agencies.

EDUCATION AND CERTIFICATIONS

- MS, Computer Science | University at Buffalo
- BS, Instrumentation Engineering | Andhra University
- Certified Information System Security Professional (CISSP)

Virginia Fraser

Higher Ed Integration Advisor

WHY VIRGINIA IS A GREAT FIT FOR MASSACHUSETTS

Extensive Higher Ed & Program Management Leadership: With over 22 years of experience leading large-scale transformations for higher education and public institutions, Virginia has delivered initiatives such as the University of Chicago's Shared Services transformation and the Iowa Board of Regents' efficiency program. Skilled in managing multi-year programs and cross-functional teams, she is well-positioned to align academic stakeholders with the DCC's strategy and objectives.

Governance & Organizational Transformation Experience: Recognized for designing governance frameworks, operating models, and shared services structures, Virginia has helped universities and state systems restructure policies, processes, and decision-making models to drive efficiency, accountability, and long-term sustainability. These capabilities directly support the integration of higher education perspectives into the DCC governance model.

Strategic Assessment & Change-Enabled Adoption: Experienced in conducting strategic assessments and roadmap development, Virginia connects vision with execution, ensuring that new systems and governance models are both well-designed and fully embraced by stakeholders. Her focus on change management and adoption promotes the DCC will be a trusted and widely used platform.

Ask Me About…

- My 19+ years of experience in supporting institution's academic missions
- My time working at Carnegie Mellon University as a research project director
- Check out my LinkedIn with the QR code above!

Cross-Functional Collaboration & Stakeholder Engagement: Skilled at convening university executives, faculty, researchers, and government leaders, Virginia has led workshops, executive briefings, and design sessions to build consensus in complex environments. She excels at translating technical and governance deliverables into value for the academic community, ensuring meaningful engagement and adoption.

Policy Alignment & Ethical Technology Integration: Experienced in aligning transformations with policy, compliance, and regulatory requirements, Virginia works closely with executives, boards, and legal counsel to safeguard responsible data stewardship. She has also developed governance and accountability frameworks that supports emerging technologies, including AI, are deployed ethically and sustainably.

Cross-Sector Connector: With a career spanning higher education, government, and public institutions, Virginia is uniquely positioned to act as a bridge across communities, ensuring the DCC reflects the diverse needs of its stakeholders and delivers long-term value statewide.

EMPLOYMENT HISTORY

Deloitte

Principal *September 2003 – Present*

- Led multi-year transformation at the University of Chicago, creating Shared Services supporting HR, Procurement, and Finance across 36 divisions.
- Directed the Iowa Board of Regents efficiency program across three universities, identifying $100M+ in savings and building a shared services roadmap.

- Designed and implemented Harvard University Library's Shared Services model, combining organizational redesign with IT transformation across 70+ libraries.
- Managed large-scale higher education and state government projects at Columbia, Dartmouth, Tufts, and the Maine DHHS, covering finance, HR, IT, and research administration.

EDUCATION AND CERTIFICATIONS

- BS, Human Development and Family Studies | Pennsylvania State University
- Master of Public Management, Financial Resources| Carnegie Melon University, Heinz School

Joe Conti

AI Strategy & Ethics Lead

WHY JOE IS A GREAT FIT FOR MASSACHUSETTS

Deep Knowledge in Ethical AI & Fairness Frameworks: As Deloitte's Trustworthy AI leader with over 23 years of experience on Government and Public Services, Joe has guided agencies in adopting AI fairness capabilities including bias detection, auditing, mitigation frameworks, and fairness dashboards. He has developed bias impact documentation and monitoring systems that increase transparency, accountability, and equitable access directly supporting the DCC's mission of ethical AI adoption.

Strategic AI & Analytics Leadership: With senior leadership roles at Bank of New York Mellon and AIG, Joe successfully developed and implemented global analytics strategies, integrated data governance practices, and advised on technical architecture and enterprise data platforms. His ability to align AI strategy with organizational and policy goals positions him to guide the DCC's strategic direction in AI and analytics.

Governance, Compliance & Risk Management: Joe has managed regulatory compliance and governance programs across highly regulated industries, working directly with regulators and audit teams. He has designed secure, audit-ready data environments that incorporate privacy, fairness, and accountability requirements, ensuring that AI innovation is balanced with compliance and risk oversight.

Ask Me About…

- Empowering agencies to use AI while mitigating AI risk
- Check out my LinkedIn with the QR code above!

Program Leadership & Global Coordination: Joe has led multinational teams and complex transformation programs, balancing technical delivery with strategic oversight. His ability to coordinate across disciplines and stakeholders drives DCC toward achieving its objectives while embedding responsible innovation and sustainable impact.

Public Sector & Market Strategy Experience: At Deloitte, Joe developed and executed go-to-market strategies for Health and Life Sciences and Mortgage Banking practices, delivering AI-driven risk analytics solutions that balanced innovation with governance. This cross-sector experience strengthens his ability to align the DCC's work with both public sector needs and broader industry innovation.

EMPLOYMENT HISTORY

Deloitte

Managing Director — *March 2022 – Present*

- Directing the development and deployment of advanced analytics and Trustworthy AI solutions for public sector and financial services clients, focusing on ethical AI, risk management, and scalable data platforms.
- Empowering agencies to harness AI to solve some of the most complex problems they face, while mitigating and monitoring AI threats and vulnerabilities, and protecting the American public.

Bank of New York Mellon

Head of Innovation & Analytics — *September 2016 – March 2022*

- Led international teams in internal audit, forensic investigations, and regulatory compliance, implementing data governance frameworks and process automation across multiple regions.
- Championed innovation and analytics transformation within Internal Audit, launching a global data and automation strategy that increased audit efficiency and consistency by embedding advanced analytics into every stage of the audit lifecycle.
- Directed enterprise technology audit strategy across Finance, Risk, Legal, and HR, strengthening governance, validating regulatory findings, and deepening regulatory relationships to enhance control effectiveness and resilience.

EDUCATION AND CERTIFICATIONS

- BS, Computer Science | Pace University
- Certified Fraud Examiner

Angela Welle

Human Centered Design Lead

WHY ANGELA IS A GREAT FIT FOR MASSACHUSETTS

Human-Centered Design Leadership: Angela is a seasoned leader in human-centered design, user research, and citizen experience transformation, having led modernization projects for 20+ federal agencies, 8 state governments, and 7 countries. She applies methods such as ethnographic research, persona development, journey mapping, and large-scale surveys to promote platforms that are intuitive, inclusive, and accessible for diverse user groups including researchers, agency staff, and the public.

Digital Transformation & Public Sector Modernization: Experienced in launching new business portals, modernizing DMV services, and integrating legacy systems into user-friendly platforms, Angela has consistently delivered projects that improve access, usability, and adoption. Her cross-agency experience enables her to align technical platform design with organizational needs, ensuring the DCC reflects both academic and government priorities.

Stakeholder Engagement & Facilitation: Angela is adept at engaging executives, faculty, researchers, and community leaders through workshops, design sessions, and customer research engagements. She excels at building consensus across diverse stakeholders, translating insights into actionable design improvements, and ensuring platforms meet the needs of both technical and non-technical users.

Ask Me About…

- My time serving in the United States Senate
- My international experience in Thailand, Finland, and more
- Check out my LinkedIn with the QR code above!

Innovation & Rapid Delivery: A strong advocate for accessible, user-centered platforms, Angela has a proven record of delivering MVPs quickly, scaling solutions for government

clients, and embedding continuous feedback loops to refine design. Her approach enables the Data Commons Collaborative to evolve rapidly while maintaining usability, accessibility, and trust.

EMPLOYMENT HISTORY

Deloitte

Senior Manager *September 2020 – Present*

- Angela stood up an MVP for new business services portal with Salesforce in less than 5 months, branded as the New Hampshire Business Gateway.
- The New Hampshire Business Gateway also includes a new single sign-on solution with Okta that is being used, with the support of our team, by multiple agencies. Demoed solution directly to the Governor.
- For the Connecticut Secretary of the State Business Registration System, she implemented system modernizations, enhancements, and M&O of the business registrations system (BRS) for the state, to include integration into the new Business.CT.gov site. This allows businesses to register and complete business filings and payments online. Also stood up a new statewide Trade Names Registry for town clerks that is integrated into BRS.

EDUCATION AND CERTIFICATIONS

- BS, Business Administration | The Ohio State University
- Master of Business Administration | William and Mary University, Mason School of Business
- Lean Six Sigma Green Belt

Kendall Legarreta

Development Lead / Technical Project Manager

WHY KENDALL IS A GREAT FIT FOR MASSACHUSETTS

Proven Technical Leadership: With over 9 years of experience, Kendall has led agile development teams of 20+ developers and subcontractors to deliver user-centric, data-driven applications for federal clients. She fosters collaborative team cultures, implements agile practices, and drives project momentum through proactive risk identification and structured onboarding processes. She directed the design, development, and deployment of high-impact web applications for the IRS, including a public-facing payment application accessed by millions of users. Skilled in JavaScript, React, AWS, Tableau, and Databricks, Kendall maintains performance optimization, accessibility (508 compliance), and coding standards, creating scalable, reliable, and user-friendly platforms.

Ask Me About…

- My interest in building scalable code, fashion, music and travel
- My experience with using Responsible AI with GitHub
- Check out my LinkedIn with the QR code above!

AI Innovation & Efficiency Coaching: Guides teams in responsible adoption of AI tools (e.g., GitHub Copilot, AWS Q, Deloitte AI solutions) to improve efficiency and workflows, while emphasizing areas where human skill remains critical. Provides practical, hands-on strategies for integrating AI into the development lifecycle without compromising quality.

Agile Delivery & Risk Management: Experienced in managing project schedules, testing pipelines, and release cycles, Kendall specializes in delivering complex IT projects on time and within scope. She applies agile methods to enhance collaboration and rapidly adapt to evolving requirements, ensuring secure and scalable solutions.

Stakeholder Communication & Client Partnership: Known for translating complex technical concepts into business-friendly language, Kendall builds strong client relationships and supports executive decision-making. She

has coordinated across multiple delivery partners and managed programs of 100+ people, ensuring clear communication and alignment with client goals.

EMPLOYMENT HISTORY

Deloitte

Senior Consultant — *November 2018 – Present*

- Serves as a GenAI Coach, guiding project teams in adopting AI tools to optimize workflows, boost efficiency, and overhaul their approach to end-to-end project delivery.
- Led 2 development teams for the IRS, building taxpayer-facing and internal applications for use in taxpayer data processing.
- Developed and deployed features for the National Institutes of Health. Led team adoption of scrum practices, facilitated onboarding of team members, and conducted digital transformation efforts such as website audits and feature enhancements.

American Society for Engineering Education (ASEE)

Non-Profit Researcher — *June 2016 – November 2018*

- Conducted UX research and designed UI wireframes for the ASEE survey system, enhancing user experience and functionality. Designed and built the WordPress webpage, leveraging wireframes to improve the interface and accessibility for users.
- Wrote scripts to analyze data from 400+ engineering schools for US rankings and publications. Created data visualizations using Tableau, R, and Excel to effectively communicate insights and support ASEE's research initiatives.

EDUCATION AND CERTIFICATIONS

- BA, Computational Mathematics | George Washington University
- Scaled Agile Framework

Kevin Harlen

Lead Data Architect

WHY KEVIN IS A GREAT FIT FOR MASSACHUSETTS

Data Architecture & Modernization Leader: Kevin has 8+ years of experience designing and delivering enterprise data platforms and governance models for state agencies, including modernizing legacy systems into scalable, centralized infrastructures. His knowledge in technical architecture, metadata management, and cataloging tools directly supports the DCC's mission to build a discoverable, interoperable, and FAIR-compliant data commons.

API-Driven Access & Analytics Enablement: As a senior leader on data and AI projects, Kevin has overseen the design of API-based architectures, usage tracking, and role-based identity management systems. His work creates secure, interoperable, and extensible platforms that enable analytics, innovation, and accountability.

Governance, FAIR Data, & Ethical Practices: Kevin has led teams to establish governance frameworks, metadata validation processes, schema alignment, and version control practices, ensuring datasets are compliant, traceable, and reliable. His work on initiatives such as the Vaccine Equity Initiative highlights his ability to embed fairness, transparency, and ethical governance into technical architectures.

Cross-Functional Leadership & Integration: Experienced in leading multidisciplinary teams of engineers, architects, and analysts, Kevin bridges technical and policy domains to deliver data ingestion

Ask Me About…

- My love of outdoor sports, especially mountain biking
- My interest in developing AI and machine learning models
- Check out my LinkedIn with the QR code above!

pipelines, cataloging tools, and analytics-ready environments. Known for aligning architectural design with business and regulatory needs, he upholds delivery of systems on time, positioned for long-term adoption.

Commitment to Public Sector Innovation: With a proven record supporting state government data modernization, and specifically in Massachusetts, Kevin brings the technical depth and strategic leadership needed to safeguard the DCC's architecture is secure, scalable, and sustainable, while fostering broad adoption across academic, government, and industry stakeholders.

EMPLOYMENT HISTORY

Deloitte

Senior Manager *December 2019 – Present*

- At the Pennsylvania Turnpike Commission (PTC), Kevin led the design and deployment of scalable data platforms, a skill directly applicable to building the Mass AI Hub's centralized analytics infrastructure.
- Kevin's work at PTC developing interactive dashboards and predictive analytics supports the AI Hub's goal of enabling innovative, data-driven decision-making for stakeholders.
- Kevin's experience at the MA Department of Public Health developing advanced analytics and reporting for public health programs translates to building actionable analytics capabilities within the AI Hub, especially for health-related use cases.
- Kevin's work modernizing data systems for the MA Department of Health equips him to address the unique challenges of integrating and upgrading legacy state agency data for the Mass AI Hub.

EDUCATION AND CERTIFICATIONS

- BS, Cellular Biology and Neuroscience | Montana State University
- Ph. D, Genetics and Genomics | Harvard University

Drew Hawk

Data Engineer / Data Integration Lead

WHY DREW IS A GREAT FIT FOR MASSACHUSETTS

Data Engineering & Integration Leadership: With over 12 years of experience delivering data-driven solutions for state and local health agencies, Drew has led the design of data ingestion pipelines, schema alignment, and metadata enrichment to build centralized repositories such as the Golden Table database for MassHealth. His work established FAIR compliance, interoperability, and analytics-readiness, directly supporting the DCC's mission.

Data Management & Interoperability Experience: Skilled in Master Data Management (MDM), Enterprise Data Management (EDME), and API-driven integration, Drew has overseen the implementation of metadata frameworks, lineage tracking, and governance models to harmonize multi-agency datasets into secure, accessible, and compliant platforms.

Modernization & Enterprise-Scale Delivery: Experienced in application modernization and data platform enhancement, Drew has managed initiatives such as migrating systems from PowerBuilder to .NET for the Florida Retirement System. He has led end-to-end SDLC delivery for complex projects, ensuring enterprise-grade systems are scalable, reliable, and interoperable.

Ask Me About…

- My passion in mentoring and coaching my team members
- Anything University of Alabama related – Roll Tide
- Check out my LinkedIn with the QR code above!

Data Curation, Quality, & Version Control: Drew has developed centralized data repositories and curation pipelines, ensuring data from disparate sources is harmonized, well-documented, and traceable. He is adept at implementing data quality monitoring and version control, maintaining long-term integrity and compliance.

Synthetic Data & Ethical AI Practices: A recognized leader in privacy-preserving data integration, Drew has implemented synthetic data pipelines that meet HIPAA and state audit standards, validating them for both accuracy and utility in AI development. He has also designed bias detection frameworks, auditing tools, and impact documentation workflows, embedding ethical AI guidelines and governance structures to promote fairness, transparency, and trust in data platforms.

Cross-Functional Leadership & Stakeholder Engagement: Known for bridging technical design with stakeholder priorities, Drew has led cross-agency collaborations to deliver FAIR-compliant platforms and align technical systems with strategic objectives. His ability to integrate technical understanding with governance and adoption frameworks drives the DCC platform to remain robust and trusted statewide.

EMPLOYMENT HISTORY

Deloitte

Manager *November 2013 – Present*

- Led the development and implementation of the MassHealth Golden Table data repository, integrating disparate data sources to support analytics and reporting for the Massachusetts Executive Office of Health and Human Services.
- Managed the modernization of the Florida Retirement System's legacy applications, overseeing the migration from PowerBuilder to .NET and coordinating enhancements to improve system scalability and maintainability.
- Directed fit-gap and feasibility assessments for the State of Washington's Labor & Industries programs, evaluating enterprise solutions and providing strategic recommendations for adoption of technology.
- Oversaw the end-to-end software development lifecycle for the Retirement Systems of Alabama, including requirements gathering, development, testing, and successful go-live of critical business modules.

EDUCATION AND CERTIFICATIONS

- BS, Accounting | University of Alabama
- Master of Business Administration | University of Alabama

4.0 Description of the Firm / Qualifications

4.0 Description of the Firm / Qualifications

4.1 Overview of Our Experience and Key Differentiators

Whatever the focus - data curation and generation, ethical AI innovation, operational efficiency, secure platforms, or faster technology adoptions - our data Alliance relationships, GovConnect solution, and vast system integrator experience make us uniquely qualified to help build not just a Data Commons, but the *right* Data Commons for MassTech.

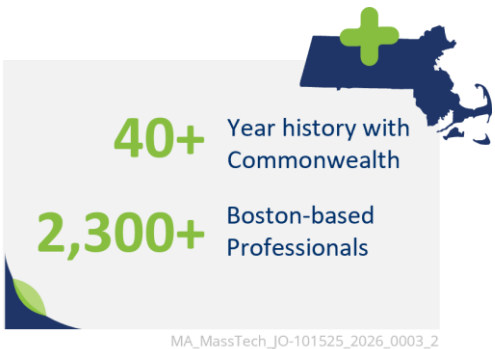
Deloitte has identified and forged relationships with leading companies in the data space to help tap into the value potential of using innovative, agile, differentiated, and market leading technologies.

Why Deloitte?

- We are committed to working with the Commonwealth of Massachusetts and have 40+ years of successfully delivering State and Local government projects as well as Higher Education programs.
- We are committed to the community through our participation in efforts, such as 'Yes Boston' which Deloitte sponsors with the goal to connect investors with Boston-based start-ups to create a community for entrepreneurs. Co-sponsoring the "Food as Health" initiative with the Boston Chamber of Commerce and MassChallenge where the winning start-ups are awarded credits for AWS cloud credits.
- We have a robust Higher Education practice which provides us unique insights into how researchers and users from these institutions will leverage the AI Hub.
- We have chosen Snowflake, the Commonwealth's established data platform provider, to create a gateway to AI-enabled datasets, which we have successfully implemented within DPH.
- We have built portals and data hubs used by millions of Americans (see page 10 for links) – and we've already started designing the DCC portal.
- We offer AI management and oversight experience proven through our work with AWS, Anthropic, and OpenAI (see page 10 for more information)

4.2 Deloitte's Footprint in the Commonwealth and Beyond

Empowering Massachusetts' AI Future



Deloitte has a 40+ year history supporting the Commonwealth of Massachusetts and 2,300+ Boston-based professionals. Our team has first-hand experience with the challenges facing the Commonwealth, including coordinating among diverse stakeholders, a constrained workforce managing labor-intensive processes, financial constraints, and regulatory uncertainty. Our experience, ability to deliver at scale, and knowledge of your stakeholders and environment contribute to our confidence that we can deliver an impactful, tailored, AI-enabled data solution to meet current and evolving needs.

With deep experience in AI-ready data management, Deloitte is implementing scalable AI platforms in public health modernization initiatives as well as financial services automations across the Commonwealth.

Keeping Sustainability at the Forefront of Local Operations

Deloitte's presence at Winthrop Center positions the firm at the forefront of innovative sustainability and workplace excellence in Boston. By occupying space in one of the world's largest Passive House office buildings, Deloitte demonstrates a deep commitment to environmental responsibility and employee well-being.

The advanced design enables Deloitte to operate in a workspace that dramatically reduces energy consumption—up to 60% less than conventional buildings. The environmentally conscious Deloitte office at 115 Federal Street supports a culture of collaboration, agility, and wellness, offering state-of-the-art amenities and public spaces that foster teamwork and engagement.

By choosing Winthrop Center for our new office, Deloitte set itself apart in Boston's business community as a leader in sustainability and as a firm dedicated to creating a vibrant, connected, and future-ready workplace. This strategic location reinforces Deloitte's reputation for forward-thinking solutions that make us the ideal partner for MassTech to continue to make a positive impact on local people, businesses, and the city.

Deloitte in Action

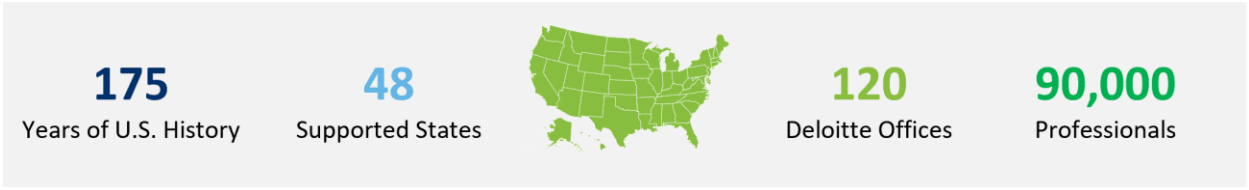
Since 2024, Deloitte has collaborated with the Massachusetts Executive Office of Economic Development (EOED) to envision, architect, and launch the Commonwealth's inaugural public-facing business engagement platform—Business Front Door (BFD). Through a collaborative, human-centered approach, Deloitte and EOED consolidated disjointed workflows into this intuitive digital portal in just nine months. Less than a year after go-live, there are 1,023 businesses in the Commonwealth with BFD accounts, able to connect with MA staff for personalized support, and access resources from the single platform.

Building Upon a Global Legacy

Deloitte is the largest global consulting firm, with a steadfast commitment to delivering measurable, lasting results for our clients. Over our 175-year history, we have supported organizations across higher education, public health authorities, financial services, and more, including 48 U.S. states. Additionally, Deloitte has successfully deployed AI solutions that handle more than 100 million interactions annually, decreasing manual processes and minimizing human error. Our experience lies in transforming uncertainty into possibility and implementing rapid change into lasting progress. We excel at anticipating needs, collaborating effectively, innovating continuously, and creating opportunities from unforeseen obstacles.

Deloitte operates as a global network of member firms, each a separate and independent legal entity. Over the past ten years, there have been no significant ownership changes within our global network. We have maintained our structure leveraging local experience, while providing global reach and resources.

Deloitte's Nationwide Reach



Today, Deloitte has over 120 offices in the United States and employs more than 90,000 professionals in the U.S. and 400,000 globally. As the world's largest consulting firm, we support clients in taking decisive action and achieving sustainable results. We have been ranked the #1 global consultancy by Gartner and continue to lead in professional services, bringing the right skills to every engagement, including those with the Commonwealth of Massachusetts.

Drawing Upon Our Dedicated Higher Education Practice

Deloitte's dedicated Higher Education Practice dates to 1913, when we first began serving colleges and universities. Today, we have proudly served more than 500 higher education institutions, including 75 of the top 100 according to the current U.S. News & World Report college rankings and 65 of the top 100 research universities by R&D expenditures. Specifically, Deloitte has served the Commonwealth of Massachusetts and its educational institutions by providing a wide range of professional consulting services to public and private institutions and systems of higher education, as well as the Massachusetts Executive Office of Education (EOE) and the Department of Higher Education (DHE). We not only help our higher education clients solve their most complex challenges within their institutional walls, but we also partner with them in cutting-edge research and innovation, as evidenced by our numerous partnerships and collaborations, including MIT Media Lab.

From technology strategy and transformation to workforce and administrative modernization to enterprise and cyber risk, Deloitte collaborates with our Higher Education clients to solve their most pressing issues. As a result, we have a strong understanding of, and deep appreciation for, the academic mission and shared governance culture of higher education institutions. Our value comes from working with hundreds of institutions facing serious challenges for the future and bringing such experience to the Commonwealth of Massachusetts as a trusted advisor.

We are also proud of the 1200+ dedicated higher education practitioners that make up our Higher Education practice – including former higher education CFOs, CIOs, CHROs, and Controllers. Our people have sat in the shoes of the individuals in higher education who we serve. A critical component of any successful business relationship is a highly qualified and committed team of professionals who align with higher education's unique culture and have direct experience working with higher education institutions.

Deloitte has worked with leading institutions to deliver transformative AI solutions that drive operational efficiency, enhance decision-making, and improve stakeholder experiences. Leveraging our Advise, Implement, and Operate (AIO) framework, we support clients throughout their AI journey—from strategy development to solution deployment and ongoing optimization. Deloitte's ongoing investment in AI, cloud, and emerging technologies ensures we remain at the forefront of delivering innovative, scalable, and secure AI solutions. Our goal is to standardize service delivery, improve decision-making, and unlock new value for clients across industries, including higher education.

As part of our commitment and dedication to the sector, Deloitte founded an incubator for higher education leadership, research, collaborations, and innovation – The Deloitte Center for Higher Education Excellence ("The Center"). The Center conducts groundbreaking research that informs insights and recommendations to help colleges and universities navigate complex challenges and reimagine how they achieve excellence in every aspect of their mission: teaching, learning, research, and community service. Through forums, immersive lab sessions, and national convenings, we engage the broad higher education community collaboratively, exploring critical topics, overcoming constraints, and expanding the limits of the art of the possible.

Deloitte's Center for Higher Education Excellence Resources

Click here to access Deloitte's Center for Higher Education Excellence!

Preparing Students for an AI-driven Workforce and the Future of Work

How Higher Education Can Realize the Potential of Generative AI

Significant Risks Facing Higher Education: Getting to the Roots of Risk

2025 Higher Education Trends

Leveraging Local Luminaries

Our professionals bring deep experience in IT strategy, data management, cybersecurity, governance, and risk management, delivering secure solutions tailored to the Commonwealth's strategic objectives in advancing AI capabilities while maintaining ethical, secure, and collaborative approaches to data management and innovation. Deloitte's thought leadership in the trustworthy and ethical use of AI positions us to guide the Commonwealth in harnessing AI's potential responsibly, fostering innovation while maintaining public trust. Our team has a proven track record of successful collaboration with the Commonwealth, including a recent partnership with the Department of Public Health to implement the enterprise data platform. This involved developing platform technologys and infrastructure, creating a data governance operating model, establishing an analytics platform, and developing AI and Gen AI use cases.

4.3 Ecosystem of Strategic Partnerships

Creating Meaningful Alliances To Deliver Results

Deloitte's relationships with leading organizations go beyond traditional affiliations—we form connections and innovate so clients can build their future with confidence. We pride ourselves on our tool agnostic approach that enables us to partner with a multitude of strategic alliances.

Thanks to our partnerships with over 45 leading technology companies, Deloitte is uniquely positioned to develop services and solutions that help our joint clients create added value. The menu of technical services across our alliances means Deloitte can offer the strategic foresight needed for ethical and efficient data management. Our comprehensive approach to integrating various technological solutions to meet evolving business needs, while enhancing operational capabilities, sets us apart in the Commonwealth.

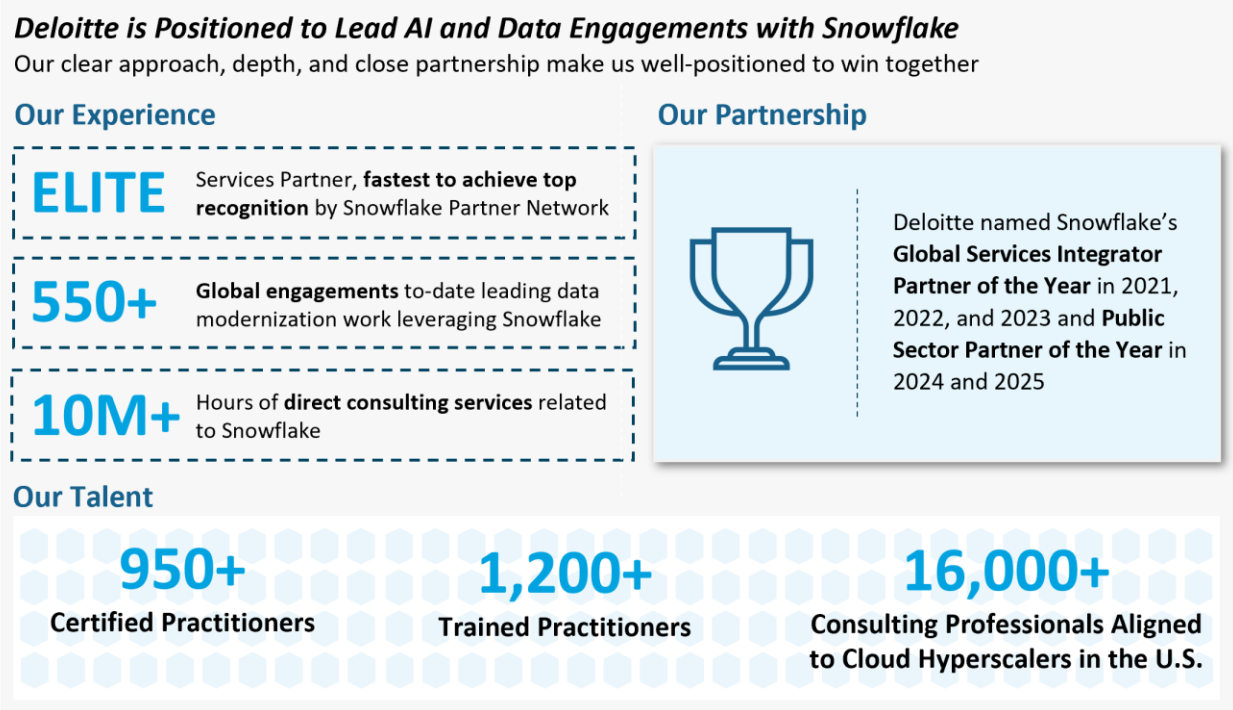
Our ability to leverage these relationships reduces risk and builds an effective AI governance strategy that will address MassTech's business needs, such as centralized access to high-quality datasets, data curation, synthetic data generation, support for AI innovation, data security, ethical use, enhanced user experience, incentivized efficient usage, and compliance with governance and legal standards, while obtaining the most value.

Transforming Technology Landscape in Partnership with Snowflake

Snowflake's cloud technology and data modernization capabilities are accelerating business transformations. We are well versed in each other's capabilities thanks to over 550 global engagements delivered in partnership. What's more, Deloitte partnered with Snowflake and the Massachusetts Department of Public Health (DPH) to deliver the Data Modernization Initiative.

Deloitte's status as a Snowflake Elite Services Partner and four-time Global Systems Integrator Partner of the Year, is yet another testament to our system integrator craftsmanship. We know how to marry advanced capabilities from Snowflake, such as the AI Data Cloud that integrates AI and machine learning, to Deloitte's leadership in strategy, analytics, and technology services. In doing so, we help businesses successfully migrate to the cloud, while reducing costs and increasing agility.

Deloitte's Snowflake Partnership


Deloitte is Positioned to Lead AI and Data Engagements with Snowflake
Our clear approach, depth, and close partnership make us well-positioned to win together
Our Experience
ELITE
Services Partner, fastest to achieve top recognition by Snowflake Partner Network
550+
Global engagements to-date leading data modernization work leveraging Snowflake
10M+
Hours of direct consulting services related to Snowflake
Our Partnership
Deloitte named Snowflake's Global Services Integrator Partner of the Year in 2021, 2022, and 2023 and Public Sector Partner of the Year in 2024 and 2025
Our Talent
950+
Certified Practitioners
1,200+
Trained Practitioners
16,000+
Consulting Professionals Aligned to Cloud Hyperscalers in the U.S.
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Highlighting Key Partnerships in the Commonwealth

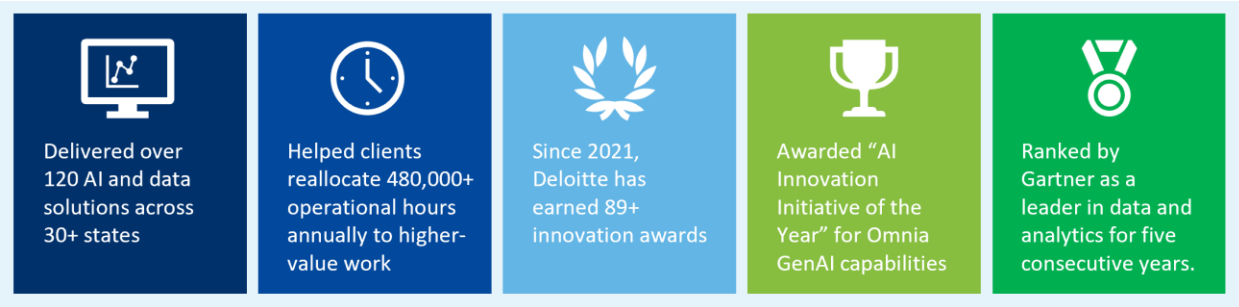
Deloitte's partnerships within the Commonwealth of Massachusetts encompass a broad spectrum of leading organizations, including renowned academic institutions as well as prominent commercial clients. Currently, Deloitte is actively supporting clients across Massachusetts on initiatives designed to develop secure, scalable, and human centered platforms for data sharing, advanced analytics, and AI-driven innovation.

4.4 Track Record of Successful IT Transformations

Leading the Way

Deloitte brings deep local knowledge and firsthand experience navigating public sector data initiatives, including regulatory compliance and stakeholder alignment and coordination. We understand the complexities of platform development and have a proven track record.

Deloitte's Delivery Track Record


Delivered over 120 AI and data solutions across 30+ states
Helped clients reallocate 480,000+ operational hours annually to higher-value work
Since 2021, Deloitte has earned 89+ innovation awards
Awarded "AI Innovation Initiative of the Year" for Omnia GenAI capabilities
Ranked by Gartner as a leader in data and analytics for five consecutive years.

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Deloitte's technical teams have extensive experience architecting and integrating data and AI solutions across all major cloud providers, allowing us to leverage the optimal platform to meet the needs of MassTech, providing scalability and security. With a global investment exceeding $4 billion in AI, Cloud technology, and innovation, our state-of-the-art Deloitte Center for AI Computing facilitates the rapid development of AI solutions. The Global Deloitte AI Institute™, brings deep experience in AI, data, and automation to address unique challenges and opportunities.

Deloitte's AI Commitment

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We deliver top-tier AI services to leading commercial and government clients, helping them achieve competitive advantages through data-driven transformation. Through the Global Deloitte AI Institute, we conduct and publish novel research that takes a pulse of the market and helps drive our own investment strategy. Our data-backed technical research will catalyze the delivery of high-quality AI services, further enabling a solution that is human-centric, trustworthy, inclusive, innovative, and sustainable.

Deloitte's Transformative Market Leadership

Across all domains of DCC delivery, Deloitte has received market accolades from leading analyst firms like Gartner and IDC:

- Recognized as a Leader in the inaugural 2024 Gartner® Magic Quadrant™ for Digital Experience Services
- Recognized as a Leader in the inaugural Worldwide Cloud Security Services in the AI Era 2024-2025 Vendor Assessment by IDC
- Recognized as a Leader in the IDC MarketScape Industry Cloud Professional Services 2024 Vendor Assessment for the second time

- Recognized as a leader in the 2024 Gartner® Magic Quadrant™: Custom Software Development Services, Worldwide for the third time

Deloitte's Accolades

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Deloitte's MarketScape Data Accolades

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In this year's MarketScape: Worldwide Artificial Intelligence Services Vendor Assessment, Deloitte earned IDC's recognition as the #1 leader in applied AI for business transformations. The DCC is a unique opportunity for Massachusetts to become a global leader in ethical AI innovation. Across the globe, Deloitte's proven ability to transform client cultures to embrace AI, prioritize data integrity, and push technical boundaries highlights our potential to elevate DCC, together.

Deloitte combines data generation experience, deep industry knowledge, and emerging AI capabilities to accelerate our clients' journeys to becoming AI-fueled organizations. For the eighth consecutive year, Gartner's Magic Quadrant for Data and Analytics Service Providers has recognized these capabilities, naming Deloitte the worldwide leader in data and analytics for our "ability to execute" and "completeness of vision." Developing a best-in-class DCC, that keeps MassTech's human-centric goals at the forefront of the day-to-day, is an endeavor Deloitte takes seriously. We understand the vision and have the know-how to execute it.

5.0 Past Performance

5.0 Past Performance

Massachusetts Department of Health (DPH) - Data Modernization Initiative (DMI)

Project Spotlight

Massachusetts Department of Public Health (DPH)

WHY THIS PROJECT IS A GREAT FIT FOR MASSACHUSETTS

Total Contract Value:	**$5.5M**
Contract Period of Performance:	January 2023 - April 2025
Customer Point of Contact:	Kris Cyr, kriscyr2@gmail.com, (508) 243-9267

Summary and Impact

Summary: Deloitte partnered with the Massachusetts Department of Public Health (DPH) from January 2023 to April 2025 to deliver the Data Modernization Initiative (DMI), addressing challenges of siloed, fragmented, and outdated data systems. Through the implementation of an Enterprise Data Platform (EDP) leveraging Snowflake, AWS, and Tableau, Deloitte integrated over 40+ public health datasets from more than 10 source systems, streamlined data sharing, and enhanced data governance. The team introduced scalable architecture, robust access controls, automated reporting, and AI-enabled applications, while providing tailored training and resources to empower users and improve analytics capabilities across the organization.

Impact: This modernization effort has significantly advanced DPH's ability to generate accurate, actionable insights, leading to improved public health outcomes, including 3 curated technical training journeys and 6+ reporting dashboards. Users now benefit from enhanced data quality, faster onboarding, and automated processes that reduce manual effort and enable rapid decision-making. The introduction of AI-driven tools and the development of 6+ public-facing dashboards has increased transparency and accessibility into the Department's data, while standardized procedures and role-based access controls enhance data security and compliance. Deloitte's holistic approach has created a collaborative, efficient, and future-ready data environment, empowering DPH to respond more effectively to evolving public health needs.

Program Management & Coordination

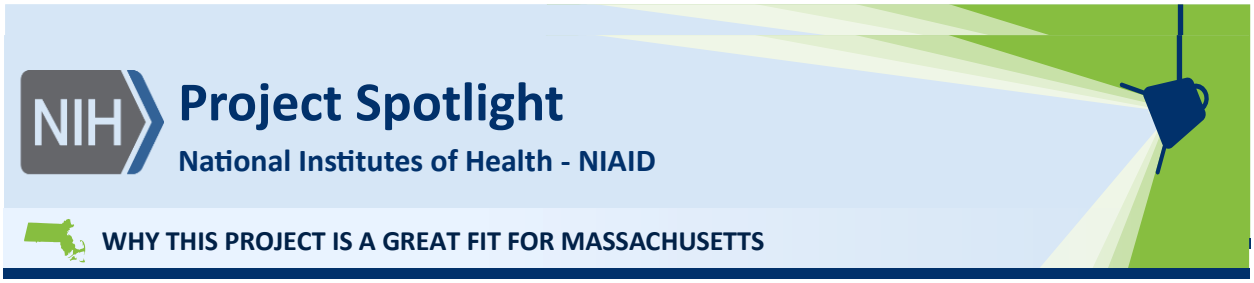
- Led end-to-end project delivery leveraging a hybrid-agile methodology, managing team responsibilities and validating alignment with client goals, accelerating timelines, maintaining project schedule, and conducting status meetings.
- Utilized proven assessment frameworks such as Data Management Body of Knowledge (DMBOK) to assess gaps and a Human-Centered Change (HCC) Framework to develop evidence-based approaches.
- Engaged with 32+ different interest holders (e.g., technology teams, legal teams, external data partners, data stewards, leadership, program teams, governance workgroups) across the project lifecycle, empowering the organization to take part in DMI decisions that fostered trust and buy in.
- Developed executive reports and communications to communicate progress and impact.
- Represented DPH in the MA Executive Office of Health and Human Services (EOHHS) AI pilot, where large language model (LLM) use cases that consolidated individual KPI updates into leadership-ready overviews were evaluated

Technical Architecture & Platform Development

- Designed and delivered a unified data platform, strengthening governance, streamlining onboarding, and enhancing analytics, empowering users with accurate insights and directly improving public health outcomes.
- Designed and developed the EDP on a scalable, secure architecture in AWS and Snowflake, enabling easy onboarding of new data sources while enhancing data quality and tracking, access controls, and data protections.
- Implemented a role-based access system with 50+ unique user roles restricting users to only the data they need and are approved for.
- Launched a user-friendly application for executive reporting using AI-powered summaries integrated with Snowflake Cortex LLM to consolidate KPI updates and deliver leadership-ready status overviews and historical trends of top commissioner initiatives.

Dataset Curation and Integration
• Unified 50+ datasets from 10+ source data systems and programs to create a single, integrated data platform in AWS and Snowflake for seamless interoperability and cross-program analyses. • Streamlined the data integration process by defining standardized development, testing, and migration procedures, accelerating data ingestion and supporting Massachusetts' growing data needs. • Developed and deployed public-facing dashboards and sophisticated data governance models in Tableau, delivering actionable analytics while advancing data quality and compliance. • Managed metadata and data lineage with Snowflake native features, improving data management and data reliability. • Created the DMI Data Catalog, increasing transparency and visibility into EDP datasets and fields and empowering end users for self-service analysis. • Developed a robust data ingestion framework integrated with Snowflake and AWS, leveraging API-driven, near real-time pipelines, event-triggered S3 streams, and bulk historical loads to support diverse sources and business cadences.
Synthetic Data Capability
• Piloted native Snowflake capabilities for synthetic data generation and masking policies to expand data access while maintaining data privacy and compliance. • Developed and tested masking policies for protected attributes (e.g., dates) within synthetic datasets, ensuring preservation of relational integrity across multiple data sources. • Used Snowflake's synthetic data generation tools to meet governance requirements, allowing users to develop and test code on synthetic data before gaining approval for use on real data.
Security, Governance, & Compliance
• Designed a role-based access system with over 50 unique user roles allowing users to be restricted to access and data they need and are approved for. • Established a user management system that reduced access request timelines by 80% and onboarded more than 80 users to the EDP. • Enabled detailed monitoring and auditing by increasing data stewards' visibility into users, data activity, and support needs with more than 15 performance and security metrics available through dashboards, automated email reports and real-time alerts, increasing steward confidence to onboard additional sensitive data sources.
Testing, Rollout, and Adoption
• Collaborated with key stakeholders to define testing and approval processes for 40+ data processing pipelines for EDP migration, resulting in comprehensive data processing pipelines. • Coordinated and executed testing and data transitions across development, test, and production environments, ensuring reliable deployment and integrity of data assets during system migrations. • Developed trainings, guides, and user features to enable enhanced analyses for end users, while creating resources and facilitating hands on trainings to empower organizations to use the EDP. • Created tailored training protocols and pathways to enhance data literacy, analytical skills, and public transparency to continue expanding adoption of the platform. • Trained 7 early adopter data stewards to promote buy-in, align on responsibilities, and educate on technical capabilities, enabling them as change champions. • Developed new educational and communications materials to strengthen the user experience, including DMI Newsletter entries and DMI Promotional Videos to reach across DPH.

National Institute of Allergy and Infectious Diseases (NIAID) – Business and Science Data Analytics (BSDA)



Total Contract Value:	**$14,655,728.53 (Current contract)** **$67,786,486.37 (Previous contract)**
Contract Period of Performance:	08/16/24 – 08/15/25 (Current contract – 1 yr) 02/16/19 – 08/15/24 (Previous contract – 5.5yrs)
Customer Point of Contact:	Joseph (Joe) Croghan, croghanj@niaid.nih.gov, 240-328-4876

Summary and Impact

Summary: The National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases (NIAID) Business and Science Data Analytics (BSDA) project, executed by Deloitte, delivered advanced analytics and AI solutions to support NIAID's mission to conduct and support research on infectious, immunologic, and allergic diseases. The project encompassed analytics, visualizations, insights, and data science activities across NIAID's offices and divisions. Deloitte provided comprehensive support in areas such as program management, governance, data visualization and analysis, data management and data quality, data science, AI/ML, GenAI, custom software development, and technological innovation.

Impact: Deloitte's work with NIH and NIAID drove transformative outcomes through strategic data and technology integration. By enabling seamless integration of disparate data sources and developing advanced analytics tools in the Clinical Laboratory Information Portal (CLIP), Deloitte empowered scientists to identify and analyze NIH clinical center patient cohorts in seconds instead of days or weeks, dramatically accelerating research and boosting productivity. Deloitte's management of data quality for the Tuberculosis (TB) Portals Program resulted in a 45% increase in case growth, 11,000+ publicly available cases, 117 publications which resulted in 2,442 citations (a 65% growth), and earned the 2023 HHS Outstanding Data Contribution award for delivery excellence in data collection, quality, and sharing. Automated data quality checks and enhanced data sharing options on the TB Portals website further improved data quality and spurred increased data access. Operational efficiency was increased through the rollout of automated processes and dashboards, notably the PC Analysis Dashboard, which enabled NIAID to reduce its active computers from 14,000 to 10,000 and realize millions in cost savings. Deloitte also spearheaded innovation in data analysis by introducing an enterprise-wide GenAI platform that leveraged AI middleware for rapid development and deployment of GenAI solutions, allowed semantic search across NIH document repositories, and enabled more consistent, efficient handling of unstructured data for over 5,000 users.

Program Management & Coordination

- Biweekly stakeholder meetings with NIAID's Chief Information Officer (CIO) and Chief Technology Officer (CTO) were conducted to align with program objectives, incorporate executive feedback on data-driven decisions, inform of project progress against milestones, determine project and pipeline priorities, and provide overall program oversight.
- Deloitte often managed 10+ concurrent project releases, resulting in about 150 projects and Production deployments per year for their portfolio of 50+ enterprise analytics dashboards and 20+ data science / custom-developed solutions
- Developed a customized Application Lifecycle Management tool used for agile project management, code development, and work item and testing tracking. This greatly improved the visibility and reliability of development, shortened development cycles, and improved overall data quality.
- Managed the TB Portals portfolio of 15+ international clinicians. Coordinated and held monthly meetings with partners to facilitate timely data collection and improve data completeness to accelerate global TB research efforts.

Technical Architecture & Platform Development

- Managed an enterprise-scale hybrid architecture with 40+ on-premise servers including Tableau, PowerBI, Microsoft SQL Server, SQL Server Integration Services (SSIS), Posit, .NET, and more as well as 2 cloud environments to support end-to-end analytics and AI solutions for 900+ users

- Designed, built, and maintained a scalable, secure, cloud-based architecture for a multi-dimensional data platform including clinical, imaging, and pathogen genomic data that leveraged AWS cloud services such as AWS Lambda, Rekognition, and Elastic Container Registry (ECR).
- Performed bulk uploads of clinical, imaging, and pathogen genomic source data into the TB data repository via an Extract, Transform, Load (ETL) process and custom APIs, aiding in 45% growth in TB cases in 2023. Developed a Data Sharing website so members of the research community could access published, deidentified TB Portals data via custom APIs and direct file download. This increased accessibility for researchers and drove a 35% increase in data usage requests.

Dataset Curation and Integration

- Integrated 3+ TB of Production data across 40+ Production databases to support cross-domain enterprise analytics/AI solution portfolio.
- Curated and integrated datasets from 15+ countries, maintaining metadata completeness and adherence to Findable, Accessible, Interoperable, and Reusable (FAIR) data principles. This maximized the TB Portals dataset value and impact that the data sharing platform had on the global research community.
- Incorporated automated data validation and data cleaning, including deidentification checks for medical images using AWS Rekognition, adhering to program standards and regulatory requirements, improving data quality, reducing errors, and enabling seamless data sharing.

AI Fairness and Bias Framework

- Developed an automated Data Anomaly Detection Engine system that profiled all source data to provide daily reports that enabled NIAID resources to accurately determine if datasets were trustworthy and reliable. This system enables NIAID to continually provide a data platform that aligns to ethical standards and data quality best practices.
- Developers undergo extensive code reviews and testing to evaluate AI fairness and proactively identify underlying bias in data. For example, in TB Portals chest X-RAYS, the team helped recognize bias based on machine-based attributes that were present in the image for some countries

Security, Governance, & Compliance

- Conducted weekly governance reviews and documentation of analytics/AI solutions based on HHS Enterprise Performance Life Cycle (EPLC) framework.
- Implemented a tiered Self-Service Governance model for data visualization dashboards, empowering self-service users to manage dashboards and data access autonomously.
- Implemented access management that is consistent with industry best practices for role-based access control to protect sensitive data and streamline user management, which included:
  - Onboarding and offboarding processes, confirming user accounts and permissions are properly provisioned based on their required role.
  - Provided different levels of access based on the sensitivity of data sets and applied least-privilege principles
  - Built column-level encryption for datasets containing PHI/PII
- Developed secure, multi-factor authentication using HHS Personal Identification Verification (PIV) cards and NIH single sign-on (SSO) for enterprise custom applications, including automated application logging for debugging and audit purposes.
- Implemented HP Fortify and SonarQube build processes for security and code quality scans.
- Maintained Authority to Operate (ATO) documentation for all Production applications with proper security controls.

Testing, Rollout, and Adoption

- Coordinated pilot testing of a GenAI Chat application, which was then rolled out to 5000+ users across NIH, accelerating staff workflows and improving personal productivity.
- Integrated CI/CD pipelines to automate releases, resulting in faster development cycles and enhanced code quality.
- Created an automated regression suite for applications to exercise full regression testing upon new releases. Daily regression tasks were used to successfully validate end-to-end use cases with external interfaces.
- Conducted stakeholder analysis and outreach, training, communication and marketing and captured success and usage metrics, which enabled Deloitte to increase user adoption and visibility of the data platform.

Ohio – Bureau of Workers Compensation (BWC)

Project Spotlight

Ohio Bureau of Workers Compensation (BWC)

WHY THIS PROJECT IS A GREAT FIT FOR MASSACHUSETTS

Total Contract Value:	**$3.9M**
Contract Period of Performance:	July 2024 – Present
Customer Point of Contact:	Aaron McGraw, aaron.m.2@gwc.ohio.gov, 614-752-4121

Summary and Impact

Summary: Ohio BWC is the exclusive provider of workers' compensation insurance in Ohio, serving nearly 257,000 public and private employers, making over 67,000 claims to injured workers. Ohio BWC faces challenges due to labor-intensive processes, disparate information storage, and overburdened workers, which hinder its ability to meet modern customer demands. To address these issues, BWC aims to adopt AI solutions that are trustworthy, safe, and equitable, while also aligning and redesigning legacy practices and processes. This integration must support ongoing strategic priorities such as Robotic Process Automation (RPA) and Customer Experience initiatives, requiring a robust architecture and multi-vendor collaboration to achieve a cohesive and sustainable modernization of its service delivery approach.

Impact: Deloitte led an AI modernization effort for Ohio BWC, conducting 8 in-person workshops that engaged more than 100 stakeholders and identified 53 priority AI use cases, each rigorously assessed through Deloitte's evaluation framework for strategic alignment, impact, complexity, and risk. Deloitte delivered comprehensive guidance across the design, development, and deployment of 5 AI and GenAI solutions, including a Generative AI-powered policy FAQ tool now supporting over 200 users, with plans to scale to more than 500 additional users. This tool was recognized at the Snowflake Summit in 2025 as a model of public sector innovation. Deloitte's work resulted in improved customer service, faster response times, reduced error rates, increased workforce efficiency, and a lower operational burden. Additionally, Deloitte performed a capability gap analysis and developed an AI/ML enablement roadmap, while establishing a robust governance and training framework to ensure compliance, transparency, and ethical AI use, fostering a culture of innovation and continuous improvement. The team's delivery of Snowflake Data Governance and MLOps pilots, paired with targeted training, positioned BWC for leadership in AI-powered service delivery.

Program Management & Coordination

- Developed and maintained the project plan and timeline for BWC throughout its Project Management Plan and timeline deliverables, which allowed project leadership and stakeholders to stay informed and lead to an on-time delivery.
- Developed roadmaps for AI/ML enablement based on current state assessment and gap analysis of the BWC technical architecture, so that the state can make sure they are prepared to implement AI/ML across BWC.
- Conducted regular stakeholder meetings and updates with BWC leadership as part of project status communications, so they were well informed of the current state of the work and what key priorities were upcoming.
- Fostered collaboration among stakeholders to ensure consistency and scalability by developing comprehensive documentation and sharing best practices.
- Encouraged collaboration among business users, technical specialists, and governance bodies, fostering a culture of innovation and continuous improvement.
- Created an AI-focused technology group to serve as a centralized resource for AI governance, training, and support for the proposed operating model and promoted innovative practices across the agency.
- Established a clear and structured process for AI project intake and management, supporting full compliance with the governance framework standards.

Technical Architecture & Platform Development

- Introduced advanced data management architecture using Data Mesh Framework and Medallion Architecture, improving data accessibility, scalability, governance, and supporting seamless API integration for interoperability across platforms.
- Highlighted Snowflake's AI/ML capabilities, demonstrating its viability as a full end-to-end AI platform, and helped BWC make informed decisions about its technology stack and future infrastructure investments. Enhanced metadata management practices to ensure data traceability, quality, and compliance.
- Educated BWC stakeholders on the benefits of environment isolation, quality assurance, security, controlled deployment, and performance testing when implementing software systems, emphasizing the segregation of environments for development, testing, staging, and production, and the importance of robust metadata management for effective data governance.

Dataset Curation and Integration
• Implemented ML lineage to trace data through pipelines and utilized Snowflake Feature Store for standardized feature transformations, enhancing ML model management and streamlining deployments. • Integrated robust dataset curation, metadata management, and data ingestion processes, along with version control, to ensure data quality, traceability, and efficient model updates.
AI Fairness and Bias Framework
• Implemented an AI solution that adhered to State regulatory requirements and ethical standards, including understanding bias, data quality, and potential impacts. Key considerations included data privacy, fairness, transparency, accountability, and compliance with relevant regulations and policies (e.g., OH IT-17) • Developed a robust governance framework to maintain compliance, transparency, and ethical use of AI technology, drawing upon Deloitte's Trustworthy AI framework and in alignment with the State of Ohio's AI requirements
Security, Governance, & Compliance
• Maintained regulatory compliance and protected sensitive data with strong governance and environment segregation, providing auditability and trust in AI/ML processes • Successfully submitted and received approvals for deployment of AI Use Cases from BWC's AI Council & Ohio's Statewide AI Council. Ohio's Statewide AI Council was recently organized to maintain governance over the adoption of AI solutions across Ohio Agencies. Deloitte prepared the necessary documentation required to review AI solutions in front of both BWC and Statewide AI Governance. • Utilized the Snowflake Data Quality Manager (DQM) suite for schema tracking and notifications, and the Trust Center for automatic tagging, classification, and governance
Testing, Rollout, and Adoption
• Guided BWC through the User Acceptance Testing of AI solutions. This included building testing protocols, coordinating stakeholder participation, capturing feedback, and tracking remediation of captured feedback to confirm acceptance of solution. • Executed a pilot for deployment while rolling out solutions to additional users upon successful pilot. • Prepared user training guides and communications plan to support the deployment so that potential users would be educated on how to best use the system and be informed about when it will be deployed and ready for use • Prepared the workforce for AI-related changes, enhancing their skills and knowledge through structured training and development programs • Developed a framework for the agency's core business users to seamlessly adopt new AI solutions, improve workers' skills and knowledge of AI, prepare the workforce for changes resulting from AI, and better understand AI's benefits and applications in everyday work • Introduced self-paced learning guides and comprehensive documentation to facilitate future implementations and reduce learning curves.

6.0 Authorized Application Signature & Acceptance Form

6.0 Attachment B - Authorized Application Signature & Acceptance Form

Attachment B
Massachusetts Technology Collaborative
Authorized Respondent's Signature and Acceptance Form

The undersigned is a duly authorized representative of the Respondent listed below. The Respondent has read and understands the RFP requirements. The Respondent acknowledges that all of the terms and conditions of the RFP are mandatory, and that Respondent's response is compliant with such requirements.

The Respondent understands that, if selected by the Mass Tech Collaborative, the Respondent and the Mass Tech Collaborative will execute an Agreement specifying the mutual requirements of participation.

Respondent agrees that the entire bid response will remain valid for sixty (60) days from receipt by the Mass Tech Collaborative.

I certify that Respondent is in compliance with all corporate filing requirements and State tax laws.

I certify that the statements made in this response to the RFP, including all attachments and exhibits, are true and correct to the best of my knowledge.

I acknowledge and understand the procedures for handling confidential materials submitted to the Mass Tech Collaborative as set forth in Section 3.1(d); I agree to be bound by those procedures and agree that the Mass Tech Collaborative shall not be liable under any circumstances for the disclosure of any materials submitted to the Mass Tech Collaborative pursuant to this RFP or upon the Respondent's selection.

Respondent: Rachel Rubenstein

By:

Rachel Rubenstein, Principal
Deloitte Consulting LLP
October 7, 2025

7.0 Compliance & Legal

7.0 Compliance and Legal

Deloitte Consulting LLP ("Consultant") is pleased to submit a proposal in response to Request for Proposals ("RFP") to solicit written proposals from qualified consultant teams to provide AI Hub Data Commons Collaborative Consulting Services .

We understand, in accordance with page 9 of the RFP, that the parties would execute and agreement upon award. Our experience has indicated that almost without exception we have been able to reach agreement with each of our clients that has awarded us an engagement, including many engagements with public sector clients. We are confident that our experience with MassTech Collaborative will be no different in this case. We believe that the basis for this success lies in the benefit of the negotiation process which allows each party to understand the other's reasonable concerns. Therefore, if we are awarded this engagement, please trust that Consultant is open and ready to promptly negotiate mutually agreeable terms with MassTech Collaborative in a collaborative and expeditious manner.

Assumptions:

- MassTech executive management will provide full sponsorship and support for this project, including approval of budget, resources, and timing and will facilitate access to leadership across divisions, third party vendors, and systems/data that are required to deliver the scope of work. MassTech shall obtain all consents necessary from third parties required for Deloitte to perform its obligations hereunder.
- Deloitte will have no responsibility for the performance of other contractors or vendors engaged by MassTech, or delays caused by them, in connection with the engagement. In the event of any delays caused outside of Deloitte's direct control, a change or deviation in scope, any failure of any stated assumptions, or MassTech (or its vendors) fail(s) to meet its obligations, Deloitte's ability to perform as set forth herein may be adversely impacted and an equitable adjustment to scope, cost and schedule will be agreed to by the parties in a change order to account for the impact. If such change order is not mutually agreed to within fifteen (15) days of Deloitte's notification to MassTech of such impact, Deloitte may suspend or terminate the Services upon written notice to MassTech.
- It is understood and agreed that the Services may include advice and recommendations, but all decisions in connection with the implementation of such advice and recommendations shall be the responsibility of, and made by, MassTech.
- When providing services, Deloitte may utilize tools and applications available in the market, such as RPA, AI, cloud, cyber, immersive, and other similar tools and applications as available. These tools and applications may be utilized for their innovation, efficiency, and effectiveness. Due to the nature of GenAI, content outputs generated by GenAI may not be covered by copyright or other IP laws; thus, any such IP provisions (e.g., infringement) in the Agreement shall not apply to generative AI work product or Deliverables; however, Deloitte will pass on any IP infringement protections we receive from the GenAI vendor to the State. In addition, connection with the Services, Deloitte may propose certain AI technologies as options for MassTech consideration as part of the solution. Depending upon the particular AI technologies proposed, Deloitte may provide additional assumptions and considerations.
- Deloitte will not provide legal advice regarding our services nor will we provide assurance regarding the outcome of future audits or regulatory examination or other regulatory action. The responsibility for legal issues with respect to these matters, such as reviewing deliverables and work product for legal implications, regulatory compliance, or anything related, will be MassTech's responsibility.

- Deloitte's proposal is submitted in accordance with the data available and provided by MassTech at the time of the SOW and all corresponding performance, dates, and pricing included in our proposal are estimates and shall be considered as such.
- Payment for Services is based on the provision of each milestone Deliverable as set forth in this pricing section. Upon early termination of any resulting Contract to Deloitte, MassTech will pay a pro-rata amount of the applicable fee for each in-progress Deliverable for work performed by Deloitte in connection with such Deliverable through the effective date of termination.
- Proposed pricing is based upon the use of offshore resources, to fill certain roles. In the event MassTech does not approve of the use of offshore resources, pricing estimates shall be adjusted accordingly.
- Deloitte may terminate this Contract or any part of the Services upon written notice to MassTech, if Deloitte determines that the performance of any part of the Services would be in conflict with law, or independence or professional rules.
- Other existing and planned MassTech initiatives, which are not defined to be within the scope of the project, will be managed by MassTech in a manner which does not adversely affect the overall project timeline. Resource conflicts and issues, as well as availability/readiness of legacy systems, shall be promptly escalated and managed by MassTech Leadership.
- Per the question and answer document, all final requirements and related agreements as it pertains to any software, hardware, hosting, and related third party products, as provided in our Response, will be directly procured and agreed upon between the State and the applicable third party vendor (i.e., Snowflake, AWS), and shall exclude Deloitte. Thus, MassTech will execute all licenses and related vendor documentation directly with the applicable third party vendors and, to the extent necessary, Deloitte is willing to consider acting as the payee agent for said transactions.

Pricing Proposal

Pricing Proposal

Pricing Summary

As requested in the AI Hub Data Commons RFP, Deloitte has completed the Services Budget Template (attached) to provide details on labor rates, hours, and total Time & Materials (T&M) not-to-exceed price. Based on our experience with initiatives of similar size, scope, and complexity, we have built up a delivery team consisting of three agile sprint teams with a mix of onshore and offshore resources to provide the estimated capacity required to perform the scope of work over a one-year anticipated period of performance.

Category	Amount
Estimated Capacity (Hours)	82,860
Total Project Cost	$11,787,440
One-Time Discount	$1,791,304
Discounted Project Cost	**$9,996,136**

Deloitte is highly committed to working with MassTech and we are pleased to offer a one-time discount of $1,791,304 as a sign of our enthusiasm and dedication to this endeavor. This reduces our total not-to-exceed T&M price to $9,996,136. This price is based on a US and offshore team composition as detailed in the Services Budget spreadsheet. Any changes to this composition at the request of MassTech may result in pricing changes.

We understand that the DCC will be a user-facing technology solution that can rapidly be stood up as a minimum viable product and will expand based functionality based on MassTech requirements, user feedback, and Governance approvals. Given this, the best unit of delivery capacity to build out the full DCC vision is a cross-functional agile delivery teams. These teams include all the required skillsets for high-performance technology delivery and can work quickly based on prioritized backlogs and incorporate feedback or pivot as needed. Using an agile scrum team-based delivery model also allows MassTech to scale up or scale down resources more easily – agile teams can easily be spun up without impacting in-flight delivery. Deloitte is also providing a rate card to procure additional services in the case that there is a highly specialized or additional resources requirement during a specified sprint.

For DCC delivery, our T&M estimate of 82,860 total hours includes:

- Cross-functional delivery capacity (development, testing, product management, UX, and DevOps) inclusive of three (3) agile delivery teams, focused on the following three implementation areas:
  - Iterative DCC external user website portal build-out
  - Iterative DCC internal user admin portal build-out
  - Iterative DCC Commons Credits system build-out
- Data architecture and engineering support to facilitate DCC platform stand-up, in collaboration with key stakeholders
- Cybersecurity support to provide end-to-end security framework implementation, monitoring, and issue remediation
- Program coordination support to manage stakeholder engagement, governance, and reporting

Should the timeline expectations, scope requirements, or implementation complexity change from our current understanding based on the estimates laid out in the RFP and DCC Requirements, then our capacity of 82,860 hours would need to be adjusted accordingly, along with corresponding changes to the total price.

To provide MassTech with greater visibility into a single unit of platform delivery capacity, we have provided a price estimate breakdown in the table below. This table illustrates the monthly cost for a single delivery team over a single month. We are open to calibrating delivery capacity based on MassTech's programmatic and budgetary priorities using a more granular approach as needed.

Category	Total Hours	1 Team x 1 Month Price Estimate	Illustrative Roles
Product / UX	400	$350,000-$450,000	Lead Product Manager, Product Management Support, UX Designer
Data Architect	270		Lead Data Architect, Data Architect
Development	1,125		Lead Developers, Full Stack Developers, Backend Developers, Frontend Developers
DevOps	230		Lead DevOps Engineer, DevOps Engineer
Testing	380		Lead Tester, Tester
Engineering	200		Lead Engineer, System Engineer
Cyber	200		Lead Security Architect, Security Engineer
SME Support	15		AI Specialist
Program coordination, governance, and change management	360		Program Director, Program Manager, Program Coordination Lead, Program Coordination Support

As the project progresses, Deloitte is open to working with MassTech and AI Hub leadership to redefine the sprint composition and estimated price. The rate card provided in the Services Budget attachment will be the basis to procure any additional hours, as required.

Snowflake Platform

We suggest that MassTech procures licenses for the Snowflake data platform. Per the question and answer response document, Deloitte assumes MassTech will independently procure Snowflake licenses to support the DCC program. MassTech should budget ~$200,000 based on standard SKUs for the required Snowflake licenses which can be obtained through existing statewide contracts.

Snowflake's pricing model is designed for flexibility and cost efficiency. Costs can be managed effectively thanks to a few key features:

- **Virtual Warehouses**: We create virtual warehouses specifically for the web application's API and for Reader Accounts. This isolates the compute costs, so heavy usage on one doesn't affect the other.
- **Auto-suspend & Auto-resume**: We can configure these warehouses to automatically suspend after a period of inactivity, so you don't pay for idle time. They will automatically resume when a new query comes in.
- **Resource Monitors**: We can set up resource monitors with alerts and automated actions (e.g., suspend or notify) to cap the credit usage for specific virtual warehouses on a daily, weekly, or monthly basis. This gives the Hub complete control and predictability over its compute spend.

Cloud Engineering

We understand that MassTech does not have a specific preference for the Cloud Service Provider (CSP) that will host the DCC solution platform. As stated in our technical response, we envision a cloud-agnostic solution architecture that can operate effectively within any cloud or on-prem container environment. We also understand that Amazon Web Services (AWS) is a major presence across the Commonwealth's IT infrastructure and has an established track record of serving as a trusted CSP for Commonwealth initiatives.

Blended Onshore/Offshore Delivery Model

In our team structure chart provided in Section 3 Team Structure and Key Personnel, we have outlined the workstreams, roles, and locations of Deloitte's DCC delivery team. We recommend that MassTech use a blended onshore/offshore delivery model for this initiative, as it will maximize value to the Commonwealth while maintaining the highest standards of quality and efficiency. Deloitte currently uses this model within multiple projects with the Commonwealth and has maintained high quality, on time delivery for these engagements. We have strict controls in place which restrict any production data access to our offshore development team members.

Deloitte's offshore practice offers clients a powerful advantage through our integrated offshore delivery model. Our offshore resources are full employees of Deloitte US, not subcontractors, and are industry-leading specialists in their technical disciplines. By combining onshore and offshore resources, we deliver high-quality outcomes, increased value, and reduced risk for our clients.

Utilizing US offshore resources allows MassTech to:

- **Increase Value:** Access a world-class talent pool, leverage round-the-clock delivery, and benefit from cost efficiencies without compromising quality.
- **Reduce Risk:** Our consistent methodologies, compliance with global standards, and integrated team structures minimize project risk and enhance reliability. Our offshore teams have been assessed at CMMi Level 5 for capability maturity, and our performance metrics for defect rates, resolution times, and employee retention are industry-leading.
- **Enhance Flexibility:** The offshore model allows for scalable resource allocation, enabling clients to respond quickly to changing business needs and project demands.

By working with Deloitte and leveraging our US India offshore resources, the Commonwealth gains access to a highly skilled, well-trained, and integrated team that delivers exceptional value, quality, and risk mitigation. Our proven hybrid delivery model enables consistent results and enables clients to achieve their strategic objectives efficiently and effectively.

Massachusetts Technology Collaborative

Grant Agreement
Standard Budget and Invoice Template
Invoiced Costs

Line Number	Budgeting																	
2	Applicant Information																	
3	Applicant: Deloitte			Procurement No.: 2026-JAII-01														
4	Budget Period: 11/1/2025 - 10/31/2026			Title of Proposed Project:														
5	Address:			AI Hub Data Commons Collaborative Consulting Services														
6																		
7																		
8				MTC Funding Requested:														
9				Total Project Cost:														
10	Cost Elements			Total Project	Invoice 1		Invoice 2		Invoice 3		Invoice 4		Cumulative					
11					Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY					
12						Amount		Amount		Amount		Amount	Expended		Remaining			
13	I. Direct Labor																	
14	*name/title*	*HRS*	*Rate*		*HRS*		*HRS*		*HRS*		*HRS*							
15	Functional Consultant – Level I	5120	$142	$727,040											$	727,040.00		
16	Functional Consultant – Level II	1920	$186	$357,120											$	357,120.00		
17	Functional Consultant – Level III	7680	$235	$1,804,800											$	1,804,800.00		
18	Functional Consultant – Level IV	0	$278	$0											$	-		
19	Project Manager – Level II	0	$300	$0											$	-		
20	Project Manager – Level III	1260	$350	$441,000											$	441,000.00		
21	Program Director – Level V	0	$395	$0											$	-		
22	UX Designer – Level I	0	$165	$0											$	-		
23	UX Designer – Level II	0	$188	$0											$	-		
24	UX Designer – Level III	0	$241	$0											$	-		
25	UX Designer – Level IV	0	$308	$0											$	-		
26	Cloud Architect – Level I	0	$143	$0											$	-		
27	Cloud Architect – Level II	320	$187	$59,840											$	59,840.00		
28	Cloud Architect – Level III	160	$235	$37,600											$	37,600.00		
29	Cloud Architect – Level IV	0	$277	$0											$	-		
30	Data Architect – Level I	0	$187	$0											$	-		
31	Data Architect – Level II	640	$235	$150,400											$	150,400.00		
32	Data Architect – Level III	0	$277	$0											$	-		
33	System Engineer – Level I	0	$143	$0											$	-		
34	System Engineer – Level II	5120	$187	$957,440											$	957,440.00		
35	System Engineer – Level III	0	$235	$0											$	-		
36	System Engineer – Level IV	960	$277	$265,920											$	265,920.00		
37	Developer – Level I	0	$143	$0											$	-		
38	Developer – Level II	0	$187	$0											$	-		
39	Developer – Level III	0	$235	$0											$	-		
40	Developer – Level IV	1920	$277	$531,840											$	531,840.00		
41	DevOps Engineer – Level I	0	$143	$0											$	-		
42	DevOps Engineer – Level II	0	$187	$0											$	-		
43	DevOps Engineer – Level III	960	$235	$225,600											$	225,600.00		
44	Security Architect – Level I	0	$170	$0											$	-		
45	Security Architect – Level II	5120	$220	$1,126,400											$	1,126,400.00		
46	Security Architect – Level III	0	$274	$0											$	-		
47	Security Architect – Level IV	960	$369	$354,240											$	354,240.00		
48	Tester – Level I	0	$143	$0											$	-		
49	Tester – Level II	0	$187	$0											$	-		
50	Tester – Level III	960	$235	$225,600											$	225,600.00		
51	Tester – Level IV	0	$277	$0											$	-		
52	AI Specialist – Level III	0	$240	$0											$	-		
53	AI Specialist – Level IV	0	$297	$0											$	-		
54	AI Specialist – Level V	360	$388	$139,680											$	139,680.00		
55	Strategy Specialist – Level III	0	$240	$0											$	-		
56	Strategy Specialist – Level IV	0	$297	$0											$	-		
57	Strategy Specialist – Level V	0	$380	$0											$	-		
58	Cloud Architect – Level I (Offshore)	0	$68	$0											$	-		
59	Cloud Architect – Level II (Offshore)	0	$94	$0											$	-		
60	Cloud Architect – Level III (Offshore)	0	$126	$0											$	-		
61	Cloud Architect – Level IV (Offshore)	0	$188	$0											$	-		
62	Data Architect – Level I (Offshore)	0	$68	$0											$	-		
63	Data Architect – Level II (Offshore)	3040	$94	$285,760											$	285,760.00		
64	Data Architect – Level III (Offshore)	0	$126	$0											$	-		
65	System Engineer – Level I (Offshore)	0	$46	$0											$	-		
66	System Engineer – Level II (Offshore)	0	$68	$0											$	-		
67	System Engineer – Level III (Offshore)	0	$94	$0											$	-		
68	System Engineer – Level IV (Offshore)	0	$126	$0											$	-		
69	Developer – Level I (Offshore)	6080	$78	$474,240											$	474,240.00		
70	Developer – Level II (Offshore)	17480	$86	$1,503,280											$	1,503,280.00		
71	Developer – Level III (Offshore)	3800	$104	$395,200											$	395,200.00		
72	Developer – Level IV (Offshore)	2280	$126	$287,280											$	287,280.00		
73	DevOps Engineer – Level I (Offshore)	1520	$68	$103,360											$	103,360.00		
74	DevOps Engineer – Level II (Offshore)	4560	$94	$428,640											$	428,640.00		
75	DevOps Engineer – Level III (Offshore)	0	$126	$0											$	-		
76	Tester – Level I (Offshore)	0	$56	$0											$	-		
77	Tester – Level II (Offshore)	6080	$78	$474,240											$	474,240.00		
78	Tester – Level III (Offshore)	2280	$94	$214,320											$	214,320.00		
79	Tester – Level IV (Offshore)	0	$126	$0											$	-		
80	Security Architect – Level I (Offshore)	0	$80	$0											$	-		
81	Security Architect – Level II (Offshore)	0	$100	$0											$	-		
82	Security Architect – Level III (Offshore)	0	$130	$0											$	-		
83	Functional Consultant – Level I (Offshore)	0	$75	$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
84	Functional Consultant – Level II (Offshore)	2280	$95	$216,600		$ -		$ -		$ -		$ -	$ -	$ -	$	216,600.00		
85	Functional Consultant – Level III (Offshore)	0	$115	$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
86				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
87				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
88				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
89	Total Direct Labor			$11,787,440	0	$ -	0	$ -	0	$ -	0	$ -	$ -	$ -	$	11,787,440.00		
90																		
91	II. Direct Labor Fringe Cost	Rate (%):	Inclusive in Rates							$ -		$ -	$ -	$ -	$	-		
92																		
93	II. Subcontractors/Consultants/Contracted Staffing																	
94	*Firm name/title or role/type of services to be provided*	*HRS*	*Rate*		*HRS*		*HRS*		*HRS*		*HRS*							
95				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
96				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
97				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
98				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
99				$0	5	$ -		$ -		$ -		$ -	$ -	$ -	$	-		
100				$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-		
101	Total Subcontractors/Consultants			$0	5	$ -	0	$ -	0	$ -	0	$ -	$ -	$ -	$	-		
102																		
103	III. Direct Materials (provide description and costs basis)																	
104				$0											$0	$0		
105				$0											$0	$0		
106				$0											$0	$0		
107				$0											$0	$0		
108				$0											$0	$0		
109				$0											$0	$0		
110				$0											$0	$0		
111	Total Direct Materials			$0		$0		$0		$0		$0	$0	$0	$0	$0		
112																		
113	IV. Travel														$0	$0		
114																		
115	V. Other Direct Costs *(list type and description such as venue rental costs and cost basis)*																	
116				$0											$	-	$	-
117				$0											$	-	$	-
118				$0											$	-	$	-
119				$0											$	-	$	-
120				$0											$	-	$	-
121	Total Other Direct Costs			$0		$ -		$ -		$ -		$ -	$ -	$ -	$	-	$	-
122																		
123	VI. General & Administrative Expense/Overhead	Rate (%):	Inclusive in Rates												$	-		
124																		
125	Discounts			$1,791,304													$	1,791,304
126																		
127	**Total PROJECT COSTS**			**$9,996,136**		**$0**		**$0**		**$0**		**$0**	**$0**	**$0**		**$9,996,136**		

LEGEND:

Formula cell
Data entry cell

This section is for post-contract invoicing only. Do not complete with proposal.

Massachusetts Technology Collaborative

Grant Agreement
Standard Budget and Invoice Template
Invoiced Costs